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Furnace Installation for Heating Nickel

Double-Chamber Oil-Fired Units for Heating Slabs for
Rolling and for Annealing—Automatic
Control Provided

BY GEORGE ELLERTON, JR.*

EARLY this year the American Nickel Corporation, Clearfield, Pa., decided to install oil-burning furnaces to replace their coal-fired furnaces. As there was some uncertainty about the effect of the products of combustion of oil upon the nickel, a small under-fired furnace was used to determine this point. The results, using test pieces, demonstrated the feasibility

and products of combustion to come in contact with the material on the hearth, thereby giving rapid and uniform heating. These vents connect to outside flues (patented) running parallel to the furnace wall.

Due to the heavy load, the hearths were made exceptionally heavy. The ordinary under-fired furnace has 4-in. or 6-in. thick hearth tile and, to get produc-

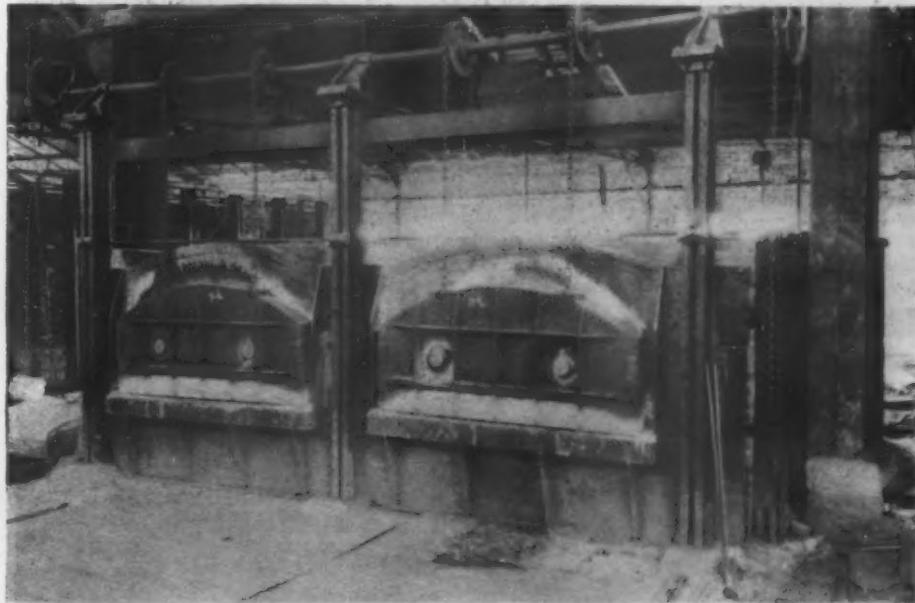


Fig. 1.—Double-Chamber Under-Fired Furnace for Heating Slabs of Nickel for Rolling

bility of the fuel and type of furnace. Each test piece was rolled to the desired thickness with one heating, against two heating periods in the coal furnace.

As a result of information thus obtained, a double-chamber under-fired furnace was installed for heating, for rolling slabs of nickel 10 in. wide x 30 in. long and 3 in. thick. Each chamber of this furnace (shown in Fig. 1) is 5 ft. wide and 10 ft. long, with a working opening at one end 5 ft. wide x 12½ in. high to the skew of the arch. Each chamber is heated independently of the other by two positive pressure oil burners which fire through the rear wall under the hearth.

The vents in each heating chamber are located in the door jambs and rear walls at hearth level. The patented location of these vents forces the hot gases

tion, the operators force the furnace, thereby getting extremely high combustion chamber temperature, with destructive effects on the hearth tile. In this furnace, however, a 9-in. arch, spanning the combustion chamber, is covered by a course of vitrified brick, which withstands the abrasion of charging and discharging the material better than tile or firebrick.

In charging, the slabs are placed on a buggy which is run up to the front of the furnace, and then are pushed into the furnace by hand. After heating, the slabs are pulled out of the furnace by hand upon this buggy and taken to the rolls.

For annealing nickel wire and sheets a double-chamber side-fired car type furnace was installed. This furnace has two heating chambers, each 7 ft. 3 in. wide x 20 ft. long with working openings 7 ft. 3 in. wide, x 4 ft. 4½ in. high at one end.

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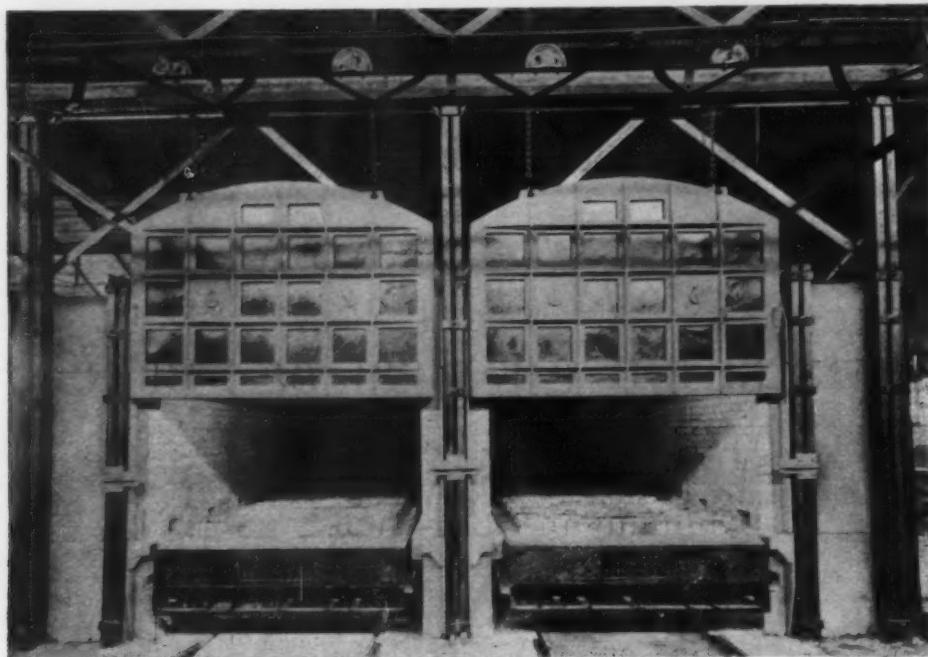


Fig. 2.—Double-Chamber Side-Fired Car-Type Furnace for Annealing Nickel Products

Each chamber is entirely independent of the other and is heated by six positive pressure oil burners. These burners fire through the side walls into combustion chambers located at one side of the heating chambers and separated from them by a bridge wall. The hot gases and products of combustion pass over the bridge wall into the heating chamber and, after circulating around the material, enter vents in the burner side wall and are expelled to the atmosphere at the top of these walls. No stack is necessary. The refractory interior of the furnace is bound on the outside by red brick and insulating brick covers the main arch to reduce loss of heat by radiation.

A structural steel frame car forms the hearth of each furnace, as shown in Fig. 2. Each car has six wheels and six axles, provided with Hyatt roller bearings. The lining of each car is 11 in. thick, made up of vitrified, fire and insulating brick, and brick piers extend above the top of each car, on which the material rests. This allows free circulation and allows heating

on all sides of the material. The material is placed on the car in trays with covers, and a charge of approximately five tons has been heated from cold to 1650 deg. Fahr. in 4½ hr.

In connection with the above furnaces a complete oil conditioning equipment was installed. Starting with two 15,000-gal. storage tanks, each having steam heating coils, the oil is pumped by a motor-driven pumping system having a capacity of 340 gal. per hr. This system, driven by a 1-hp. motor, is provided with a duplex strainer on the suction line, a relief valve for regulating the pressure, a pressure gage and a foot valve in each tank to keep the lines from drawing, each time the pump is shut down.

From the pumping system the oil is forced through a live steam oil heater which heats the oil to the proper temperature for best atomization. The heater is provided with a thermometer in the discharge line and a steam trap on the steam discharge line. When using light oil this heater is not needed, but it is pro-

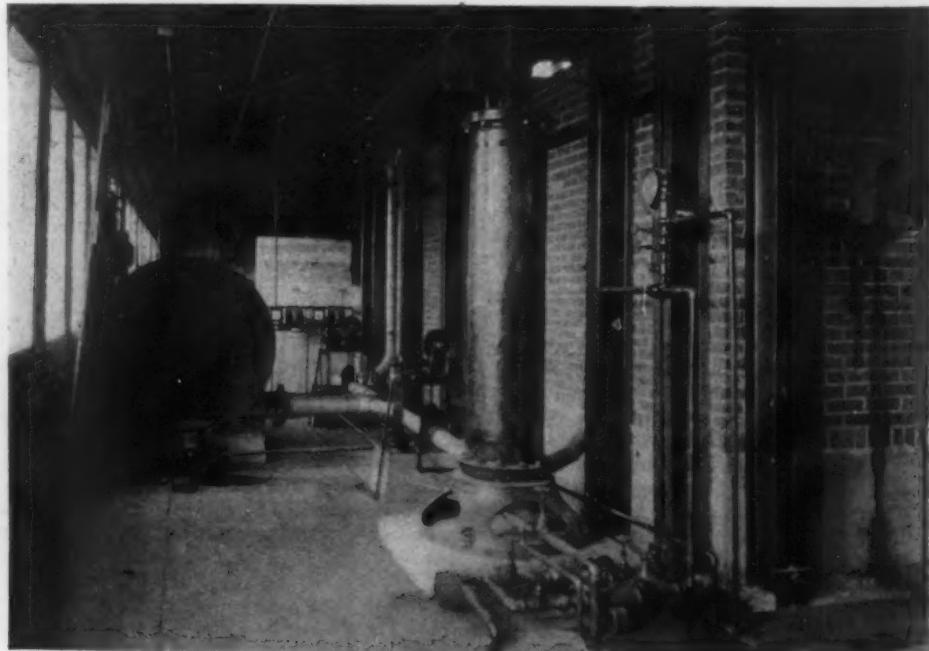


Fig. 3.—Rear View of Car-Type Furnace, Showing Blower, Heater, Shut-off Valve, Duplex Strainer and Automatic Control Units

vided so that any grade of oil can be used. (See Fig. 3.)

After leaving the heater the oil again is passed through another duplex strainer, which has a much finer mesh than the one on the suction line of the pump. This additional straining reduces to a minimum the necessity for cleaning burners. By using duplex strainers one side can be cleaned without interrupting the operation of the burners.

An automatic shut-off valve is placed in the oil supply line to each furnace. These valves automatically shut off the oil if, for any reason, the air pressure is interrupted. A connection is provided from the air line to the diaphragm on the valve and, as long as pressure is maintained on the diaphragm, the valve remains open, but when the air pressure is released the valve closes and remains closed until opened by the operator.

An oil return line conveys any excess oil back to the storage tank so that the oil is constantly circulating and a fresh supply is always being fed to the burners. Air at $1\frac{1}{2}$ lb. per sq. in. pressure is supplied to the burners by Spencer turbo-compressors. One compressor is installed for each furnace, so that any furnace can be operated singly without operating an over-sized blower. (See Fig. 3.)

All oil supply lines inside of the building are placed in concrete trenches covered by steel plates and, since there is a blower for each furnace, the blower and air piping are located behind the furnace, where they do not interfere with shop operations.

Each chamber of each furnace is provided with a motor-driven automatic control unit. Each control unit is actuated by a Leeds & Northrup recorder-controller which records the temperature of the furnace and makes contact, causing current to flow, which in turn through a relay drives the motor on the control unit. Each control unit shuts off the oil and air on the controlled line, if the temperature rises above the set point, allowing only a small amount of fuel and air to pass through the by-pass for the constant firing setting. When the temperature drops below the set point the instrument makes contact, the relay acts, and the motor opens the valves in the oil and air lines by crank motions, the motor stopping at the end of the stroke of the cranks. These control units maintain

the temperature of the furnaces within 10 deg., plus or minus, of the set points, as shown on chart, Fig. 4.

In addition to the new furnaces as outlined above, burners were applied to two coal furnaces already in

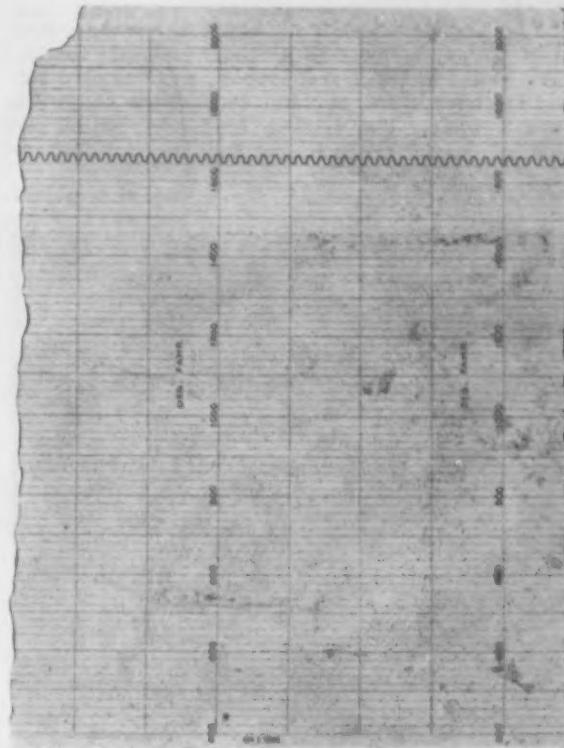


Fig. 4.—Record of Heat in One Chamber of the Car-Type Furnace

stalled in this plant. The installation of these burners in place of coal gave a much shorter heating time, as well as making working conditions better by eliminating the troublesome coal pile and resultant ashes. The oil-fired furnaces have given easier operation and a better and more uniform product.

BETHLEHEM'S PROGRESS

Impressive Statistics Indicating Developments of Past Twenty Years

Twenty years ago, on Dec. 10, 1904, Bethlehem Steel Corporation was incorporated under the laws of New York. At that time, Bethlehem was a small producer of a limited number of steel products and employed fewer than 9500 men. The current issue of the *Bethlehem Review* gives some valuable information in regard to the history of the company. In a few well-chosen words, President Grace speaks of Bethlehem's twentieth birthday, concluding as follows:

"We have reached one turning point in our history, yet I am sure we stand on the threshold of a new progress which will rival that made since 1904. That new progress depends on us. If we give to Bethlehem the best effort and thought, individually and collectively, of which we are capable, the same kind of thought and effort we have given in the past 20 years, there is no doubt about the future growth and prosperity of our business."

The Bethlehem Steel Corporation has today an ingot capacity 60 times greater than it had in 1905 with only eight times as many employees. Its cash expenditures for additions and improvement in 1905 were \$4,325,257, reached the high point in 1917, \$62,168,948, and in 1923 were \$19,914,660. The net value of properties in 1905 was \$31,520,592, while in 1923 it was \$452,936,911. The *Review* says in part:

When the corporation was formed, Bethlehem owned neither coal mines nor iron ore deposits with the exception

of small ore holdings in Cuba; and neither owned nor quarried its own limestone. Today the corporation owns and operates mines supplying its coal, ore and limestone.

These deposits alone are sufficient to maintain operations of present facilities at capacity for more than half a century.

The geographical distribution of these deposits is such as to make them available at low transportation costs to each of Bethlehem's seven steel making plants. Bethlehem is further protected against the future and helped in maintaining low operating costs by owning and operating in large part the transportation facilities on rail, lake and ocean, needed to bring these raw materials to the blast furnaces. In 1964 Bethlehem owned 12 locomotives, today there are over 150 locomotives in operation over 450 miles of Company owned tracks, as well as 23 ships in ocean and lake transportation.

Growth of Plants

In 1904 Bethlehem's entire ingot capacity, all of which was in one plant, amounted to 130,000 tons a year. The other units of the corporation were shipbuilding yards, foundries and machine shops.

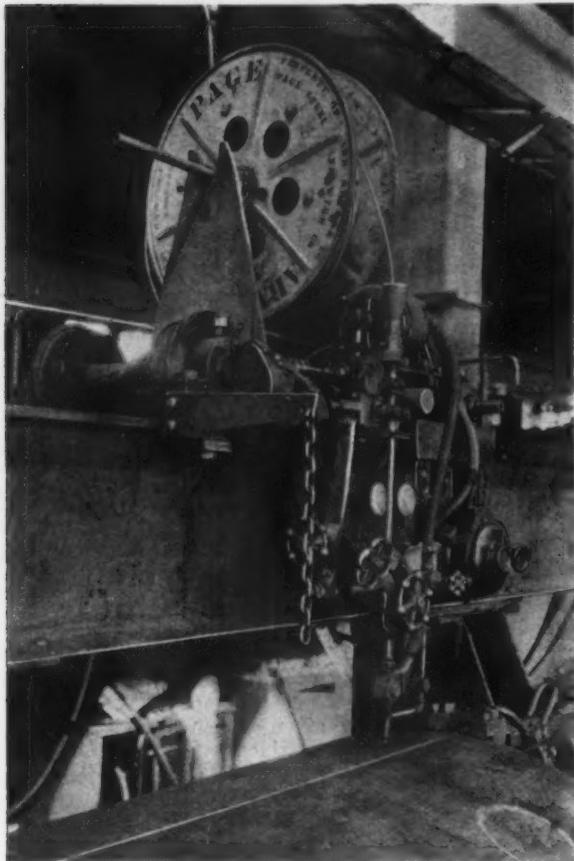
Today, Bethlehem's ingot capacity amounts to 7,600,000 tons, distributed among seven steel plants with good business locations.

Construction of a blast furnace at Santa Barbara, State of Minas Geraes, Brazil, with initial daily capacity of 30 metric tons of cast iron, has been authorized by the Federal Government. A foundry authorized at Rio de Janeiro in connection with the project will be used for iron casting production for industrial and agricultural machinery. The American Consulate, Rio de Janeiro, has information regarding the enterprise.

Traveling Carriage for Straight-Seam Welding

A self-contained travel carriage for the automatic arc welding of straight seams on a production basis, has been developed by the General Electric Co., Schenectady.

The carriage, which is illustrated herewith, is made up of an automatic welding head, necessary control, travel motor and wire reel support, mounted on a suitable framework and provided with wheels for rolling along a track. The welding head and control are mounted on the apron of the carriage and feed the



Travel Carriage for Automatic Arc Welding of Straight Seams. The uses include tanks and building up of locomotive guide rods

electrode wire from a reel, the latter being carried by supports attached to the carriage frame.

The travel carriage is controlled by means of push buttons. After the work is set up, the operator may throw the system to automatic position, the control of both the welding head and travel motor being confined to one push button. Control of the welding head and travel motor is interlocked, so that when starting button is pushed, the arc is established automatically simultaneously with the starting of the travel motor. Should the arc fail for any reason, the travel motor will stop without overtravel. The arc will re-establish itself and the travel motor will re-start, without attention from the operator. An adjustable time-limit switch stops the motor at the end of the weld and the carriage may be returned to the starting position either by hand, or electrically by manipulating the push buttons. The carriage can be provided with an oscillator for use in welding heavy plate.

Advantages claimed for the automatic process of arc welding include economy of electrical energy and increased speed.

The approximate dimensions are: Length, 3 ft. 6 in.; width, from front of apron to back of carriage, 2 ft. 7 in.; height above track, 2 ft. 6 in. The weight is 800 lb.

Wholesale Prices Slightly Higher

Every one of the nine major groups included in the wholesale price index of the Bureau of Labor Statistics showed an increase in November, compared with October. These increases ranged from 0.3 point for farm products to 3.1 for miscellaneous items, the net result being 0.8 units or 0.53 per cent for all commodities. The November average is 152.7, compared with 151.9 in October and with 152.1 in November of last year.

During the year a substantial decrease has been shown in prices of metals and metal products and a somewhat lesser decrease in cloths and clothing, building materials, fuel and lighting and house furnishing goods. The four items showing decrease, aside from metals, however, are all well above the average for all commodities, the lowest of them showing an excess of more than 10 points and ranging from this up to nearly 38 points for cloths and clothing. Other items have shown an increase during the year, the largest percentage increase being in the miscellaneous group, with foods, chemicals and drugs and farm products following in that order. Details are shown in the table:

Index Numbers of Wholesale Prices, by Groups of Commodities

Group	1924		Decrease in One Year, Nov. 1923 Per Cent	
	Nov.	Oct.	Nov.	Per Cent
Farm products.....	149.5	149.2	145.6	(a) 2.7
Foods	152.8	151.6	148.6	(a) 3.9
Cloths and clothing..	190.4	188.4	201.0	5.3
Fuel and lighting...	162.8	162.1	167.4	2.7
Metals and metal products	128.7	127.2	141.0	8.7
Building materials...	171.6	170.7	181.0	5.2
Chemicals and drugs	134.0	132.2	130.3	(a) 2.9
House furnishing goods	172.0	171.0	176.0	2.3
Miscellaneous	122.9	119.8	118.1	(a) 4.1
All commodities	152.7	151.9	152.1	(a) 0.4

(a) Increase.

Would Reopen Rate Controversy

WASHINGTON, Dec. 16.—Interested railroads last week petitioned the Interstate Commerce Commission to reopen the case in which they sought to fix higher rates on iron and steel bars and scrap between Newark, N. J., and New England points, which was decided adversely to the carriers. The petition restates the claim that the purpose of the schedules was to restore the relationship of rates on these products between Newark and Philadelphia to New England. The commission suggested that the relationship could be restored by reducing the rate from Philadelphia. The petition says that a reduction in the Philadelphia rate was impractical because it would disturb relationships between the Philadelphia rates and rates to and from points west which base on Philadelphia. The petition insists the proposed rates were reasonable. The revenue affected, it is stated, is not of great moment to the carriers, but the report (of the commission) "is surprising to the carriers because it seems to them inconsistent with the commission's own suggestions."

New High Record in Freight Traffic

October furnished the greatest freight traffic for any month in the history of the United States, according to figures of the Bureau of Railway Economics. The total was 43,109,743,000 net ton-miles, exceeding by 424,835,000 ton-miles, or 1 per cent, the previous high record, which was made in August, 1920. Compared with October of last year the increase was 900,072,000 ton-miles, or 2.1 per cent. Loading of revenue freight in October averaged more than 1,090,000 cars weekly, with a peak at 1,112,345 cars, the highest week in history. The great traffic represented in the above figures was moved not only without car shortage but with a large surplus of cars and locomotives at various points.

For Contents of This Issue See Orange Insert

What Will Labor Union Policy Be?

Speculation as to Who Will Succeed Samuel Gompers
and What Course the American Federation
Will Follow

WASHINGTON, Dec. 16.—The death of Samuel Gompers, for more than 40 years president of the American Federation of Labor, has developed speculation as to who his successor will be. The determination of the man who is to fill the place of the veteran leader of organized labor will have strong influence and perhaps will be the dominating factor in charting the trend of organized labor in the United States. Its course manifestly will be of vital importance to the industrial interests of the country. Mr. Gompers himself, despite his 74 years, was the active leader up to the time of his death, and it is expected that his successor likewise will be an outstanding force in determining the policy of organized labor. While during the later years Mr. Gompers had not participated so actively as he had previously in all of the detailed movements of organized labor, it remains a fact that he took a great part in outlining its policies.

One of the last and important steps taken by Mr. Gompers was to place organized labor on record in favor of the candidacy of Senator LaFollette for President, a curious and unusual course for organized labor, which, prior to that time, had, upon the insistence of Mr. Gompers himself, remained outside of partisan politics. The fact that Mr. Gompers had continued at the head of organized labor for 40 consecutive years, or virtually the life of organized labor since it has been a body of force, is taken by many other labor officials to have shown his original soundness.

Third Party Policy

So there is a great deal of interest as to whether the precedent of organized labor favoring a third party may set an example for the future. It is likewise a matter of a great deal of concern as to whether the so-called conservative or more radical wing of organized labor will get control. A successor will be named at a meeting of the executive council in New York the latter part of the present week. Numerous names have been mentioned, including James Duncan, first vice-president; Matthew Woll, sixth vice-president; William Green, third vice-president; and T. A. Rickert, president of the United Garment Workers. The acting president of the American Federation of Labor is its secretary, Frank Morrison. The close association between Mr. Gompers and Mr. Woll and the complete confidence which Mr. Gompers placed in him, has led some to the belief that Mr. Woll will be named as the new head of the American Federation of Labor. Mr. Woll was for 15 years head of the Photo Engravers' Union. It is believed that Mr. Woll was largely instrumental in having Mr. Gompers urge organized labor to support

the LaFollette candidacy. While Mr. Woll is not known as a radical, at the same time he has been active in movements which did not have the complete approval of the more conservative wing and, therefore, may be classed as being between the two. Others think Mr. Duncan, head of the Granite Workers' Union, will be made president. Mr. Duncan generally is considered to be a conservative in the ranks of labor.

Legislation of Recent Years

For a number of years Mr. Woll has been especially active in the advocacy of legislation by Congress for organized labor and acts on the statute books show that he has met with a great deal of success. While some of these acts were sponsored originally by Mr. Gompers and other leaders, much of the work among members of Congress and of publicity devolved upon Mr. Woll. These laws themselves, however, have been credited to Mr. Gompers and include such acts as the Clayton law, which declares that labor is not a commodity and which grew out of the conviction of Mr. Gompers and others in connection with the boycott instituted against the Bucks Stove & Range Co., of St. Louis. Legislation exempting trade unions from the anti-trust laws also was due largely to the influence of Mr. Gompers. There are those who say that Mr. Gompers virtually dictated the code of American organized labor, its policies, legislation, and otherwise, but that while he had his great victories, he also had ambitions that were denied and defeats. Among the latter was the well known desire of Mr. Gompers to organize the iron and steel industry. It was only a little more than a year ago that he again attempted to organize the industry, but, like previous attempts, his campaign failed. While Mr. Gompers finally pledged the support of organized labor in connection with the steel strike of 1919, there are those who feel that he did not put a great deal of zeal in the effort at that time to establish the 8-hr. day in the industry. As a matter of fact, it is believed by many that Mr. Gompers pledged the support of organized labor only after he felt that W. Z. Foster and other radicals had temporarily taken the reins from the more conservative element of organized labor and were gaining such strength that in order to retrieve his power Mr. Gompers was compelled to throw the sympathy of organized labor to the strikers. Mr. Gompers' later repudiation of Mr. Foster apparently confirmed this belief, in part at least. The final establishment of the 8-hr. day, while it came about directly through the influence of President Harding, in conference with steel executives of the country, was nevertheless due in no small part to its constant advocacy by Mr. Gompers.

Conflicting Views as to Federal Trade Commission

Grain Dealers' Association Would Repeal Law Creating the Body
—Others Highly Commend Its Work

WASHINGTON, Dec. 16.—The action of the Grain Dealers' National Association at its recent annual convention in going on record as favoring the repeal of the law establishing the Federal Trade Commission has created keen interest. Like other departments of the Government that have been set up, the Federal Trade

Commission has been the object of a great deal of attack and some of the charges against it have been especially bitter. Among other things, it has been claimed that the commission has been of a decidedly anti-business character and has strayed far from the purpose of its creation as announced by President Wil-

son when he said that "the business men of the country desire something more than that the menace of legal process be made explicit and intelligible. They desire the advice and definite guidance and information which can be supplied by an administration body and interstate trade commission."

The Grain Dealers' Association in its resolution declared that business men had the right to expect friendly cooperation with the commission but that widespread dissatisfaction now exists concerning the attitude of the commission toward business and "grave doubts are entertained by a large portion of business men concerning the usefulness of the Federal Trade Commission."

Following up its resolution, the Grain Dealers' Association circularized different trade associations asking whether or not they believed the commission serves any useful purpose or whether they consider that it is simply an annoyance and harassment to legitimate business. Inquiry was also made whether they would be willing to join the Grain Dealers in an effort to have the commission abolished. At least so far as available replies are concerned, the proposal of the Grain Dealers has met with disapproval. The Paint Manufacturers' Association of the United States and the National Varnish Manufacturers' Association have advised the Grain Dealers' Association that they have found the Federal Trade Commission "of inestimable service in helping these industries to make and keep their trade practices clean and fair." The secretary of these associations declared that they would regard the abolition of the commission as a "calamity to decent American business and a confession that business in the United States cannot be conducted even remotely in accordance with the ten commandments."

The American Walnut Manufacturers' Association, which organized an export company under the Webb-Pomerene act, declared that its association had found contact with the Federal Trade Commission in this connection very satisfactory. It was also stated that the commission has been active in suppressing frauds in merchandise alleged to be made of American walnut wood.

In conclusion, the secretary of the American Walnut Manufacturers' Association says: "In view of these helpful contacts, I hardly think that our members would consider joining a movement to abolish the Federal Trade Commission. It may be true that the Federal Trade Commission has interfered with some industries but we do not believe that it will do anything but help an industry that plays the game square and does not attempt to violate the provisions of the Sherman and Clayton acts in letter or in spirit."

Little Buying of Pig Iron at Toronto

TORONTO, Dec. 16.—Following the active demand for pig iron in the Canadian market during the last two weeks of November business has now declined to an occasional order for spot delivery. The advance in price which went into effect Nov. 21 resulted in many melters hurrying to cover for the remainder of this year and first quarter requirements. While many large consumers succeeded in placing contracts at the then prevailing price of \$26.30 for No. 1 iron, there were a number who failed to take advantage of the opportunity and a second advance of \$1.50 per ton, effective in both Toronto and Montreal markets, caught these unprepared. While a number of consumers have already covered for first quarter needs, local blast furnace representatives say that there is still a large tonnage to be booked on this account in Toronto and Montreal. In Montreal contracts during the past week or 10 days amounted to about 2000 tons. The demand in the Toronto district is almost entirely for spot iron and orders seldom exceed 50 to 100 tons.

While no further change has been made in prices during the week, those quoted are strong and show an advance of \$2.50 per ton over those prevailing a month ago. Prices are as follows: No. 1 (2.25 to 2.75 silicon), \$27.80; malleable, \$27.80; No. 2 (1.75 to 2.25 silicon), \$27.30, Toronto; No. 1 and malleable, \$30.30; No. 2, \$29.80, Montreal.

British Pig Iron and Steel in November

LONDON, ENGLAND, Dec. 15 (*By Cable*).—The pig iron production in November was 583,500 gross tons, a slight decrease from the October output of 586,400 tons. The total steel output in November was 672,800 tons, comparing with 678,500 tons in October.

Comparative production figures for the British steel industry in gross tons per month are as follows:

	Pig Iron	Steel Ingots and Castings
1913, per month.....	855,000	639,000
1920, per month.....	669,500	755,600
1921, per month.....	217,600	302,100
1922, per month.....	408,300	486,000
1923, per month.....	619,800	707,400
January, 1924.....	631,500	690,100
February.....	612,700	767,600
March.....	668,600	825,200
April.....	618,400	711,500
May.....	650,900	809,700
June.....	607,800	651,500
July.....	615,600	693,300
August.....	588,900	527,500
September.....	569,200	645,000
October.....	586,400	678,500
November.....	583,500	672,800

The November pig iron output of 583,500 tons compares with an average monthly production of 632,500 tons per month for the first half. The steel output in November of 672,800 tons contrasts with 741,900 tons per month to July 1, this year.

Increasing Plant Operation

The Campbell, Wyant & Cannon Co., Muskegon Heights, Mich., has adopted a five-day week schedule at its local foundry on Henry Street, replacing a three-day week operating basis, in force for some time past. Employment is being given to approximately 500 operatives.

The King Axe Co., Oakland, Me., is increasing its working force and operating schedule. It is proposed to engage a full quota of men at once. The Dunn Edge Tool Co. is also advancing operations at its local plant and will give employment to a full working force at an early date.

The Chevrolet Motor Co., Buffalo, is arranging for the immediate resumption of capacity operations at its local assembling plant, heretofore on reduced operating basis for a number of weeks. The working force will be brought up to about 300 men.

The Durant Motor Co., Lansing, Mich., is increasing production at its local plant and has adopted a schedule of 2800 completed cars during the present month. The working force will also be increased.

The Waltham Watch Co., Waltham, Mass., has added to its working force during the past few weeks and is now giving employment to about 600 operatives as compared with 200 employees previously and during the recent strike.

The Bethlehem Steel Co., Sparrows Point, Baltimore, has adopted a working schedule of about 70 per cent of capacity at its local mills, and will continue on this basis for a number of weeks to come. All six furnaces are in blast.

Work on the construction of the new gas ovens at the Perry plant, Erie, Pa., of Pickands, Mather & Co., Cleveland, is now about half completed. The contract for the installation of ovens and equipment has been awarded to Arthur G. McKee & Co., Cleveland. The ovens, when completed will be used by the Pennsylvania Gas Co. in blending artificial and natural gas for public service in Erie and vicinity. The cost of the project is estimated at \$500,000.

Prof. A. L. Scipio, dean of engineering of Roberts College, Constantinople, Turkey, addressed the Cincinnati section of the A. S. M. E. at its meeting Dec. 11, describing his experiences in the Near East during the past 12 years. Professor Scipio is now exchange professor stationed at the University of Cincinnati, his place in Constantinople having been taken by Prof. A. L. Jenkins of Cincinnati.

New Portable Electric Tapper and New Electric Socket Wrench

The portable electric tapper illustrated, which is designated as the No. 2, is a recent addition to the line of the Black & Decker Mfg. Co., Towson, Md. The machine is similar to the company's electric drills except that the mechanism in the gear case is arranged to drive the tap at 350 r.p.m. By a slight backward pull on the machine the tap chuck is reversed automatically and the tap backed out of the hole at twice the speed of the tapping. A reversing switch is not employed. The machine is equipped with a universal motor and is rated to tap $\frac{1}{4}$ -in. holes.



The Tap Is Driven at 350 R.p.m. It is reversed automatically and backed out at twice the driven speed

in steel, up to $\frac{3}{8}$ in. in cast iron and up to $\frac{5}{8}$ in. in brass and aluminum. The weight is 8 $\frac{1}{2}$ lb.

A reversible electric socket wrench designated as the No. 3 has also been placed on the market by the Black & Decker company. The general design is similar to the company's portable electric drills except that the spindle is equipped with a clutch which releases automatically when the forward pressure on the tool is relieved. The design of the clutch is said to permit the driving of nuts, bolts and studs to any desired tightness. A reversing switch permits the machine to be employed in disassembling motors and machinery, and there is said to be ample power to loosen nuts or bolts that have been drawn up tightly. The chuck, which is of the quick-change type, accommodates various sizes of socket wrenches. The machine is regularly equipped with a spade handle, a side handle and 15 ft. of electric cable.

Floor Plate of Light Weight

To provide a floor plate for engine rooms and other places where a non-combustible floor must be used, which shall be reasonably free from danger of slippage, the Central Iron & Steel Co., Harrisburg, is rolling a plate of which an illustration is given here. The deformations measure 2 in. in length and $\frac{1}{8}$ in.



in width. The plate is rolled in all gages from $\frac{1}{8}$ in. upward and in a fair range of sizes and is lighter than usual for a given gage of steel.

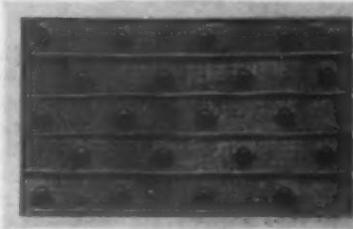
French iron and steel production is going ahead at an excellent rate, Commercial Attaché Butler, Paris, cables the Department of Commerce. Export orders are good. Furthermore, there is a bill proposing tariff increases on approximately 300 articles, principally iron and manufactures, scheduled for next week. A quick passage is predicted for this bill.

New Leather Belting

Suction belting, known as Tentacular and marketed previously in Europe, was among the new products shown at the National Exposition of Power and Mechanical Engineering held in New York, Dec. 1 to 6. It is claimed to eliminate slippage, high tension of belts, high pressure on bearings, and use of belt dressings. Considerably more power is said to be transmitted for the same width of belt.

This belting, which was exhibited by Alexander Brothers, Inc., 14 South Street, Philadelphia, is made up of oak tanned leather to the under surface of which are attached narrow longitudinal strips of soft and spongy chrome tanned leather. The strips of chrome leather are held in position by means of hollow brass rivets, as shown in the accompanying illustration of the inside of the belt. The depressions, or hemispherical pockets in the strip, having the inside of the hollow rivet as bottom, are intended to act as suckers and cause the adhesion of the belt on the pulley. The adhesion of the belt is also increased to a large extent because of the spongy chrome leather which is treated with tallow. The spacing between the strips is intended to permit any air film between the belt and pulley to be squeezed out. Shifting from fast to loose pulleys is effected as with the usual leather belting and because the belting illustrated can be run at lower tension, stretching of the belt is said to be less than usual.

The Tentacular patent includes other material than oak-tanned leather and other materials may be used as backing for belting to meet special conditions. The



Inside View of Suction Belting. The backing is of oak tanned leather to the underside of which are riveted narrow strips of spongy chrome tanned leather as shown. High adhesive power is claimed

thickness of the chrome leather strips is $4/32$ in., although thicker strips may be employed. The strips are either $\frac{3}{8}$ or 1 in. wide. The dressing used is tallow, which is melted and spread over the chrome strips with a brush. This dressing is applied two or more times a year, depending on the drive, and as a rule, the tallow dressing is required when the strips become dry or a slight slippage occurs. Other belt dressings are unnecessary.

The oak tanned leather backing is emphasized as providing high tensile strength, although alone it would have a low power of adhesion. The soft chrome leather which comes in contact with the pulley has, on the other hand, high adhesive power, although unfitted to transmit power alone. The combination of these two materials and the manner of attaching them is claimed to provide a belt of high strength and high power of adhesion. The riveting of the strips to the backing is stressed as important, in that it preserves the freedom of stretch of the soft chrome leather. The suction pockets are regarded as simulating the pulling power of a chain drive.

Automatic stokers sold in November are reported by the Department of Commerce at 106 for a total of 37,167 hp., compared with 104 in October of 58,565 hp. The current figure compares with 50 stokers of 16,241 hp. in November, 1923, and with a 1923 monthly average of 122 stokers and 60,870 hp.

The Ranson & Orr Co., 819 Dixie Terminal Building, Cincinnati, has been appointed exclusive agent for the sale of pig iron manufactured by the Norton Iron Works, Ashland, Ky. Norton furnaces will go into blast this month, producing foundry, malleable and Bessemer grades of iron.

Small Worm-Gear Speed Reduction Unit

A standardized worm-gear reduction unit for transmitting loads up to 3 hp., and available in several ratios from 5 to 1 to 30 to 1 has been added to the line of the Cleveland Worm & Gear Co., Cleveland.

This unit, which is designated as the size O, type RT, is fully inclosed and is adapted for use on small conveyors and elevators, mechanical stokers and other low-powered equipment. Compactness is a feature emphasized as permitting use of the unit as an integral part of manufactured equipment now using exposed spur or bevel gearing. It may be used also as a speed booster in a 1 to 5 ratio.

The worm has a straight body with a 30 deg. pressure angle involute thread. It is made from a solid



Worm-Gear Reduction Unit for Loads Up to 3 Hp. Several ratios from 5 to 1 to 30 to 1 are available. Compactness is a feature

forging of low-carbon nickel steel, carbonized, case hardened and ground all over, including flanks of the threads. The worm bearings are of the radial thrust type, and the shaft is standardized both as to size and keyway so that standard couplings may be used. The worm wheel is a solid casting of special analysis bronze and Timken roller bearings are used on both sides of the wheel to carry both thrust and radial loads. The wheel is pressed on a steel shaft, which may be extended on either side or on both sides if required. The wheel bearings are oiled by splash from the oil reservoir, which furnishes the lubricant for worm bearings and also for contact between worm and gear.

The housing is a gray iron casting of heavy wall section. The interior, which has been kept free of offsets or pockets, and also other unfinished surfaces are smoothed and cleaned, then coated with oil and heat-resisting compound. The exterior is thoroughly rubbed down, filled and coated with hard machine paint.

Impact Stress in Concrete Stadium

While planning repairs for a large reinforced concrete stadium the question arose as to whether the girders possessed sufficient strength to permit adding a considerable dead weight to the structure. Extensive load tests carried out recently showed extremely slight deflections and indicated ample strength when static load was considered. Application was made to the Bureau of Standards for a test to determine whether moving loads causing impact and rhythmic deflections would set up stresses great enough to reverse the conclusions based upon static loads. For this purpose electric telemeters, of the type described in Technologic Paper 247, were used and observations of stresses in the reinforcement of beams and girders were made during the entire progress of a recent football game when the stadium was loaded to full capacity.

The results have not been fully studied, but it is clear that stresses due to all causes were very low. The indication is that the static live load stress in the steel did not exceed 1000 lb. per sq. in., and that the stress due to impact or moving load of any kind did not exceed 300 lb. per sq. in. The instrument apparently behaved well and no reason is known for doubting the indications from the tests.

These results will probably prove an important contribution to available information regarding behavior of such a structure under loads causing impact. Caution is needed, it is pointed out, in applying such results in other cases. A structure having less weight or a different period of vibration might show a greater stress.

Study of Quenching Media

Quenching experiments were conducted by the Bureau of Standards during the past month with solutions of widely different physical properties in order to develop, if possible, those factors of greatest importance contributing to high "hardening power." No general conclusions can be drawn until further experiments and compilation of data have been made.

It is interesting to note that the addition of as little as 0.043 per cent by weight of sodium oleate at water at 20 deg. C. reduced the cooling velocity at 720 deg. C. from 150 to about 35 deg. C. per sec.; likewise 0.06 per cent by weight of "White Dove" soap caused a decrease from 150 to about 25 deg. C. per sec. The first mentioned solution is extremely unstable and "broke down" when used for the second time.

Ethyl alcohol (95 per cent) was found to have the lowest "hardening power" of any liquid so far tested.

Experiments with sodium chloride brines at 20 deg. C. indicate a material decrease in hardening power as the concentration of salt in the water is increased above about 20 per cent.

Equipment for experimental study of pressure quenching has been designed and parts ordered.

Stove Manufacturers at Birmingham

BIRMINGHAM, ALA., Dec. 16.—The Southern Association of Stove Manufacturers held its quarterly meeting in Birmingham Monday and Tuesday of this week, about 40 manufacturers of stoves attending. Features of the meeting in Birmingham included visits to the blast furnaces, steel mills and stove and range foundries and a banquet tendered by the Birmingham pig iron producers, with Russell Hunt, Southern sales manager and secretary-treasurer of the Sloss-Sheffield Steel & Iron Co., presiding. Much of the iron used by the Southern stove makers comes from the Birmingham district.

Ball Parallels for Use in Drilling

Ball parallels for use in connection with the drilling or counterboring of heavy fixtures, jigs, dies and other heavy work are shown in the accompanying illustration. They are intended to permit the drill or counterbore to pull the work in line with the spindle. The manufacturer, the J. F. Smith Tool Co., Dayton, Ohio,



Ball Parallels Used in Drilling Heavy Work

is offering two sizes, one of which is 1 in. wide and 6 in. long and is fitted with $\frac{1}{4}$ -in. balls. The largest size is 1 x 7 in. in size and is equipped with balls $\frac{3}{8}$ in. in diameter.

Stoves and hot air furnaces to the value of \$155,601,516 are reported by the Census Bureau to have been produced in 1923 by 343 establishments, employing 32,994 wage earners. This compares with \$101,572,793 of products from 357 establishments and 24,530 wage earners in 1921. Wages for the two years were respectively \$45,817,125 and \$29,827,914. The horsepower used in 1923 was 65,722 and the coal consumed 174,915 net tons. The establishments in 1923 were scattered over 31 States, Ohio leading with 51 establishments and Illinois following with 46.

McCLINTIC-MARSHALL EXPANSION

Pittsburgh Company Buys Chicago Fabricating Shops—Influenced by Abolition of Pittsburgh Basing

The McClintic-Marshall Co., the largest independent American manufacturer and erector of structural steel work for buildings and bridges, has purchased the plants and business of the Morava Construction Co. and the Kenwood Bridge Co., both of Chicago. The Morava plant will be operated under the name of the McClintic-Marshall Co.-Morava Works, while the Kenwood property will be run under the style of McClintic-Marshall Co.-Kenwood Works.

Paul Willis, formerly president Kenwood Bridge Co., will be in charge of the operations of the McClintic-Marshall Co. in the Chicago district as vice-president and manager. W. Morava, president Morava Construction Co., who has been identified with the structural steel industry for many years, will retire from active business. A. J. T. Bennett, formerly secretary and engineer Kenwood Bridge Co., will continue in the capacity of contracting engineer. J. W. Davis, contracting engineer McClintic-Marshall Co. at Chicago, will remain in the contracting department. C. O. Baughman and J. A. Burnett, formerly of the Morava company, and W. W. Seymour, formerly of the Kenwood company, will continue as engineers at the respective plants with which they have been connected.

The McClintic-Marshall Co. now has 10 fabricating

shops at Pittsburgh, Pottstown, Leetsdale, Carnegie and Chicago, located advantageously to serve the Eastern, Central and Western markets. The shops have a combined capacity of 400,000 tons of structural steel and plate work per annum. In addition, the Riter-Conley Co., an affiliated company engaged in the fabrication of plate work, with a plant at Leetsdale, has a capacity of approximately 150,000 tons annually. The McClintic-Marshall Co. also owns a large tract of land at Indiana Harbor, Ind., but has purchased the Chicago plants referred to rather than build on that site at this time.

The company has contracting offices in New York, Boston, Philadelphia, Baltimore, Pittsburgh, Cleveland, Cincinnati, Detroit, Chicago, San Francisco and Los Angeles. In the past 25 years it has shipped many thousand tons of structural steel into the Chicago district from its Pittsburgh plants, but the high freight rates now in effect have made it necessary to establish fabricating works in the principal market centers throughout the United States. The national scope of the company's business was somewhat impaired by the abolition of Pittsburgh as the sole basing point on finished steel.

The McClintic-Marshall Co. bought 50 acres at Indiana Harbor, Ind., several months ago, with the intention of erecting a fabricating shop but with the purchase of the two plants, the matter of the use of the land becomes something for the future to develop. Improvements will be made at these plants; indeed, some new equipment already has been purchased.

Republic Iron & Steel Co.'s By-Product Plant at East Thomas, Ala.

BIRMINGHAM, ALA., Dec. 16.—The Republic Iron & Steel Co. will erect a by-product coke oven plant at East Thomas, near the three blast furnaces of the company and along the railroad which connects with the coal properties of the company a few miles away. The first battery will be of 57 ovens. Work will start in the next few weeks. At present the Republic is having its coke manufactured by the Semet-Solvay by-product plant at Ensley, furnishing coal therefor. Previously the Republic company operated beehive ovens at East Thomas. Two out of three blast furnaces are in operation, the third furnace being kept in readiness to replace one of the others when repairs are needed. The Southern properties of the Republic Iron & Steel Co. consist of three blast furnaces, coal and ore mines, limestone quarries and a railroad from the coal mines to the blast furnaces.

Copper Smelting and Refining

Thirty establishments engaged in smelting or refining of copper, or both, recorded total products in 1923 amounting to \$567,984,807, compared with \$234,895,245 from 28 establishments in 1921, according to figures of the Census Bureau. The 1923 report shows 20,735 wage earners, compared with 8293, and total wages amounting to \$31,319,544, compared with \$11,199,279.

Coal consumed in 1923 was 1,116,183 net tons, while the horsepower used aggregated 432,886. Of the 30 establishments, 9 were located in Arizona, 4 in New Jersey, 3 in Montana and the remaining 14 in 11 other States.

Bituminous coal to the extent of 433,797,000 net tons has been produced in the United States in 1924 through Dec. 6, according to figures of the Geological Survey. This compares with 514,200,000 tons in the corresponding period of 1923. Current weeks, however, show higher production than last year, with 10,612,000 tons in the week ended Dec. 6, compared with 9,829,000 tons last year, and with 9,640,000 tons in the week ended Nov. 29, compared with 8,943,000 tons last year.

Heavy Building Construction Along the Atlantic Seaboard

November building construction, at \$379,659,600, places the first 11 months of 1924 above the total for all of 1923, with \$4,154,753,100 from the 36 Eastern States, according to F. W. Dodge Corporation. This is 13 per cent above the first 11 months of 1923 and 4 per cent above that entire year. The biggest increases this year have been from New York to Florida, in all the Atlantic seaboard States.

More than half the November construction was residences, \$191,318,600. Industrial buildings at \$34,373,200 and commercial buildings at \$55,255,400 accounted, together, for 24 per cent.

Construction started in 11 months in New York and North New Jersey, \$1,229,287,300, was 28 per cent above the first 11 months and 15 per cent above the entire 12 months of 1923. In the Middle Atlantic States the \$452,731,800 was 29 per cent above the first 11 months and 21 per cent above the entire 1923 total. In the Southeastern States the \$561,300,000 represents 23 per cent above 11 months and 15 per cent above 12 months of 1923. New England, with \$324,826,000, and the Central West, with \$974,050,600, show slight advances (6 per cent and 3 per cent) over 11 months of 1923. The Pittsburgh district total of \$527,989,400 was 5 per cent below 1923.

The Interstate Commerce Commission has held as not justified proposed increased rates on coke in car-loads from points in southwestern Virginia, Benham, Ky., LaFollette and Chattanooga, Tenn., to Cincinnati and group points and to Maysville, Ky. The suspended schedules, which have been ordered canceled, were filed to become effective Aug. 20, and proposed to increase to \$2.90 per ton the present rate on coke from and to the points named. It was also proposed to increase to \$2.90 the present rate of \$2.48 from LaFollette to Erlanger, Ky., located near Cincinnati.

Increasing employment in nearly all the middle western and many of the eastern States and generally satisfactory conditions throughout the country were reported Dec. 14 by the Labor Department, Washington.

BETHLEHEM ELECTIONS

Steel Company Employees Select Their Representatives—Trusted to Make Decisions

The Bethlehem Steel Corporation has issued the following statement:

"Votes of the employees of the Bethlehem Steel Corporation in the annual election, which has just been completed, of their representatives who will serve during the year 1925 to represent the employees in all dealings with the management, shows that 93 per cent of all eligible employees exercised their voting privileges this year. This is an increase of 12 per cent over last year when 83 per cent of the employees voted.

"The elections were held in October, November and December in the seven steel plants and five ship yards and covered the major part of 70,000 employees of the subsidiary companies of the Bethlehem Steel Corporation.

"This is the seventh annual election held under Bethlehem's plan of employee representation, and the second election in which the employees of all of the steel and shipbuilding plants have taken part. The greatest increase in number of employees voting was found in the Cambria plant at Johnstown, one of Bethlehem's more recently acquired units, where 88.7 per cent of the employees voted this year as compared to 67 per cent voting last year.

"Of the total of 304 representatives elected, 150 were reelected from last year. About 95 per cent of the employees elected as representatives are American citizens—all must have their first papers to be eligible; 41 per cent are owners of their own homes.

"The average term of service of these representatives with the company is 12 years.

"The Bethlehem plan of employee representation provides for election by shops or department or representatives by and from among the employees, to meet and deal with the management for the discussion, regulation and adjustment of matters having to do with all the conditions under which the employees render service.

"All employees on the company's payroll for 60 days, who are 18 years of age or over, are qualified voters, except those employees exercising supervisory service. The nominations and elections are conducted by the employees themselves by secret ballot.

"Since the inception of the plan, over 3300 cases have been brought before the committee for settlement. The majority of these cases have been on such vital subject as wages, hours and working conditions.

"The Bethlehem plan provides that the workers, individually and collectively, in any plant are trusted to make their own decisions. It differs from other similar plans in that elected employee representatives operating by themselves, in touch through committees with the management, pass on every employment problem not previously settled satisfactorily by the regular plant authorities."

JAPAN BUYS TIN PLATE

Expiration of Conventional Tariff Acts as Buying Stimulus—Some Inquiry for Rails

NEW YORK, Dec. 16.—Export business with the Far East continues only moderately active. Chinese merchants are beginning to exhibit more interest in offers of material and are inquiring for small lots of various materials. At present wire shorts make about the only active product. Merchants are inclined to contract ahead for shipments of small lots of wire shorts at present prices, but exporters are encountering difficulty in obtaining sufficient from the wire mills to fill current orders, although the present demand is light.

Japanese business is still confined to the purchases of the larger companies and the railroads. There has evidently been more interest in tin plate in the past few weeks than in any other product, undoubtedly induced by the expiration of the conventional tariff Mar. 10, when the regular Japanese tariff on tin plate, sheets and pig iron goes into effect. Shipments to arrive at a Japanese port before the expiration of the tariff must leave the United States on or about Jan. 10. Recent purchasing of tin plate, according to reports, has been generally of small lots ranging up to 10,000 or 15,000 boxes and as small as 500 case lots. The total, however, is estimated as large, in some cases being placed at 350,000 cases shipped between Oct. 1 of this year to Jan. 10 of next.

A recent inquiry from Japan for rails calls for 50 miles of 75-lb. sections for the Keisei Denke Kido K. K. (Keisei Electric Railway Co.), bids opening Dec. 15. The South Manchuria Railway Co. is in the market for 200 tons of tie plates. Sheet inquiries are small as a rule, but one export house reports quoting on a lot of 500 tons of light gage black sheets. The Siam State Railways are in the market for 4100 tons of rails and 27 small bridge spans. Two small inquiries for electrical sheets have recently been issued by Japanese engineering companies: one for 200 tons from the Shibaura Engineering Co.; and one for 250 tons from the Hatchi Engineering Co. Quotations on light gage black sheets show a decided upward tendency and range from \$96 to \$98 per ton, c.i.f. Japan, although slight concessions from these prices are believed to be still obtainable.

Demand for steel pipe is fairly active, merchants

inquiring for small lots and the inquiry of the Toho Gas Co. for about 300,000 ft. still being open. Black sheets, although affected by the increase of the tariff on Mar. 10, are inactive in view of the heavy stocks still available in Japan.

Pig Iron Imports

Despite the increases in the Continental iron markets, importers are in a position to import iron and it is reported that buying has been done in expectation of a further upward movement of the American market. One large importer is offering Dutch and German iron at competitive prices in the New England district, most of this iron being equivalent to No. 1X or better. Sales are reported to have been made to dealers in the United States of small lots of 500 tons or more from Belgian and French furnaces.

Meeting of Compressed Gas Manufacturers

The Compressed Gas Manufacturers' Association, representing manufacturers of all industrial gases, will hold its twelfth annual meeting on Jan. 26, at the Hotel Astor, New York. The meeting will be followed by the annual dinner on the evening of the same day. The association studies principally the technical problems involved in transportation of gases under pressure, methods of insuring the establishment of safe practices and the possibility of extending the uses of compressed gases in industry. John H. Luening, 120 West Forty-second Street, New York, is secretary of the association.

Members of the Electric Hoist Manufacturers Association, New York, report an increase of 9.21 per cent in the number of hoists sold in November as compared with October and an increase of 18.54 per cent in the value of hoists ordered. Shipments increased 2 per cent as compared with shipments made in October.

The National Tube Co. will distribute \$100,000 to its Lorain employees and pensioners who suffered a loss in the tornado last June. About 330 awards are to be made before Christmas and amounts are to be based on the extent of loss and the employees' length of service. Previously the company gave \$50,000 to the Lorain relief fund.

Feed-Water Heaters Difficult to Machine

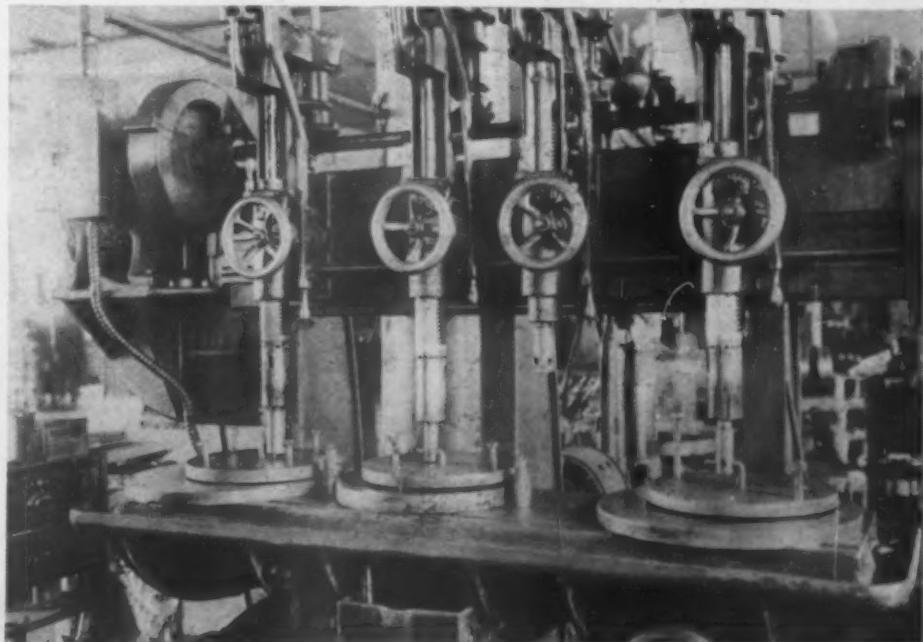
Upright Drill Used for Combined Boring and Counter-Boring Operation—Improvised Lapping Machine—Turret Lathe Practice Saves Foundry Cost

In addition to the building of oil engines at the East Cambridge (Mass.) plant of the Worthington Pump & Machinery Corporation, described in the Oct. 16 issue of THE IRON AGE, this shop has developed some cost saving practices in the manufacture of

other products, which include locomotive feed-water heaters and pumps, horizontal reciprocating pumps and marine pumping equipment.

Locomotive feed-water heaters and pumps consist of three main parts, viz., heating chamber, steam cylin-

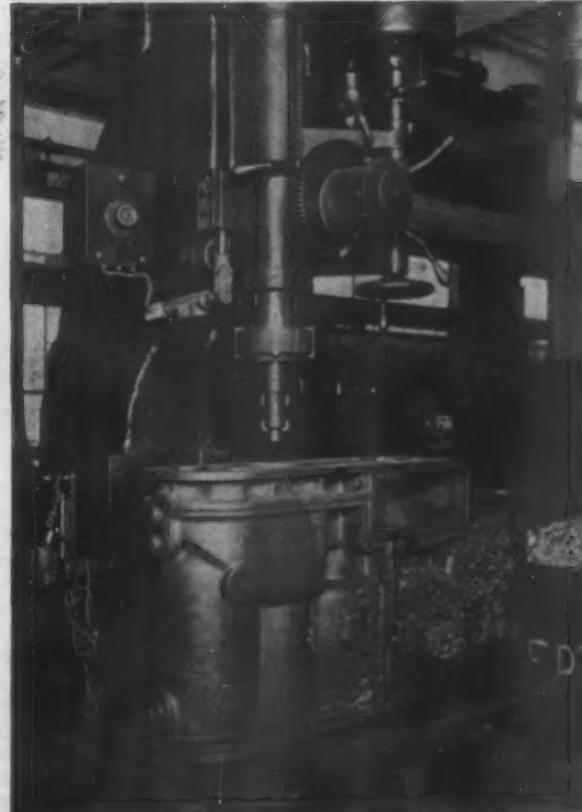
(Right) An Improvised Lapping Machine Has Been Developed From a Four-Spindle Drill Press, Employing Three of the Spindles for the Operation



(Below) A Boring Operation on the Locomotive Feed - Water Heater Has Been Taken off the Vertical Boring Mill and Placed in an Upright Drill, thus Releasing the Mill for Other Work and Still Producing the Boring Operation Without Loss of Time



Feed-Water Heater Auxiliary Steam Chest Call for a Number of Holes Drilled at Different Angles. This is accomplished by placing the drill jig on a sub-base having supporting planes at proper angles to throw the drill bushings into proper position (Above)



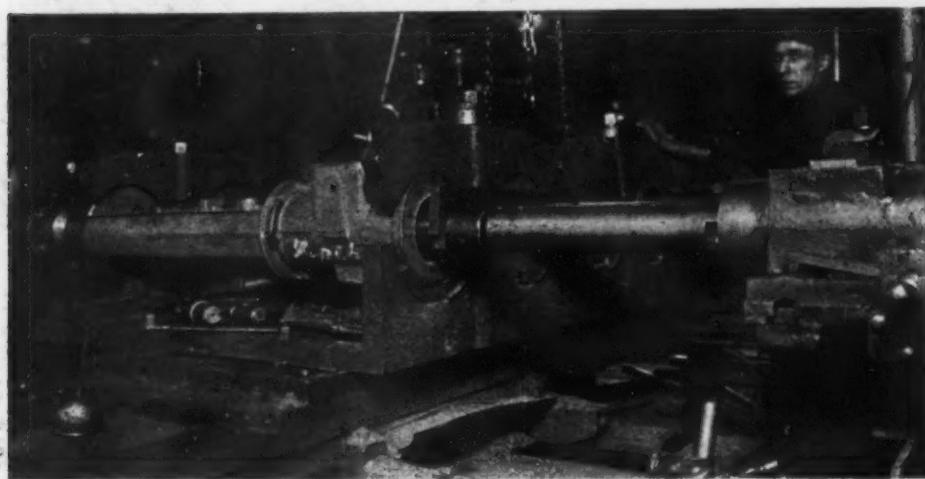
der and hot-water pump. The pump casting has incorporated with it what is known as a hot well, from which the hot water is drawn after passing through the heating chamber and bucket, being pumped from the hot well into the locomotive boiler. At the top of this hot well is a machined seat for the bucket chamber and a reamed hole in which fits the bucket spindle. It was formerly the practice to bore and face these surfaces in a vertical boring and turning mill. A large machine was called for—to clear the size of the casting, which has the pump cylinder on one side, rather than because of any heavy cuts.

To save tying up such a large machine and to reduce time consumed in actual operation, the job now is handled in a heavy duty upright drill press, with a special table on which the casting is placed, the lower surface having already been finished in a preceding operation when the pump cylinder was bored. In this way the set-up for the last operation is parallel with the bore

connection is employed. This fits transversely through a plug in the spindle and down through a hole in the top plate, thereby producing an eccentric movement to the latter, as well as the rotating motion.

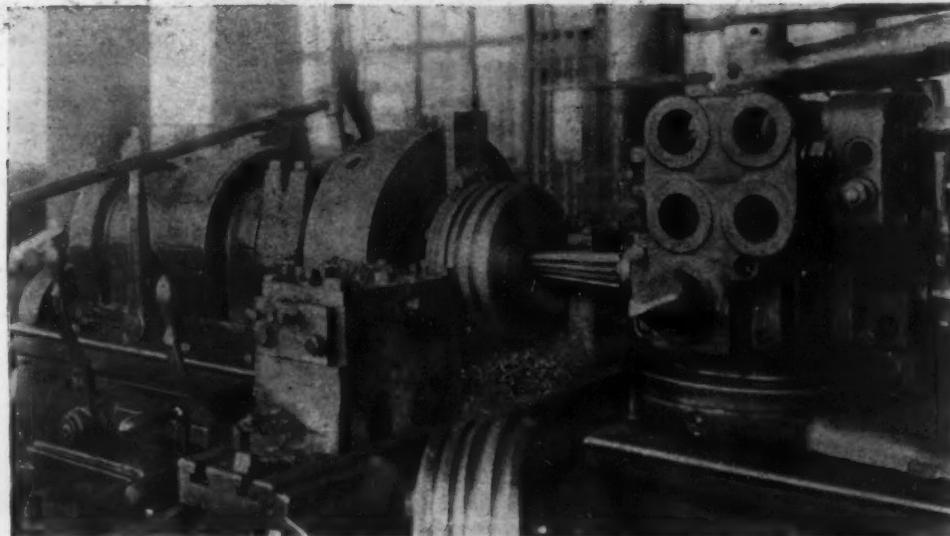
The auxiliary steam chest in this pump calls for some very exacting work. The bore is finished in an internal grinder and must come within 0.0002 in. of round and straight. In this casting are a number of holes at different angles. These holes are all drilled while the chest is set in one jig, the various angles being secured by placing the jig on a special sub-base which will accommodate the jig in two positions, resting against finished guards or flanges along the edges of the sub-base. In this manner the holes at varying angles are quickly and economically drilled under an ordinary upright drill.

Horizontal pump cylinders, two at a time, are bored, counterbored, and heads reamed and tapped for glands in a double-end horizontal boring machine with two



(Below) By Eliminating a Chucking Ring from Piston Castings, Time Is Saved and Both Foundry and Machine Work Reduced. A plate bolted to holes used for another purpose in the assembly serves to hold the pistons in the chuck

(Above) By Means of a Special Table in a Double-End Two-Spindle Boring Machine, Two Pump Cylinders May Be Set Up While Two Others Are Being Machined



of the pump. Roughing and finishing cutters are carried in the boring bar for the bucket spindle hole and above them, properly spaced, is an inserted bit milling cutter which is used to machine the seat for the bucket chamber.

In this heater and pump are several check and suction valves of the flanged disk type. Requiring very true seating, these are lapped. An improvised lapping machine for high production has been developed from a four-spindle rail type drill press. On the table are mounted cast iron lapping plates which hold the work, 8 or 10 disks at a time to each plate. On these are placed the upper or revolving lapping disks, these being turned by the drill spindles. To change the relative positions of the disks constantly, an "ell" shaped con-

spindles at each end. On this machine, which is a commercial type, the company has built a special table, sufficiently long to accommodate the two cylinders in work and at the same time allow room for the operator to set up two more. These then are ready for work as soon as the machine finishes on the first two. In this way no machine time is lost except for the change of tools for the successive operations.

To save iron and machine work, steam pistons for pumps are cast without a chucking ring. To provide a proper chucking area a steel plate is bolted to the piston casting, using pipe plug holes which are drilled and tapped in the piston face. Pistons with chucking plates attached are then chucked in three-jaw universal chuck on a semi-automatic turret lathe for turning,

facing, cutting, ring grooves, and boring and reaming the taper hole for the piston rod.

In this shop all repair parts for machines in service are made in a separate fully equipped department maintained for that purpose, so that the regular production

schedule of the manufacturing departments is not upset by the injection of such repair orders. The company also makes a number of special portable maintenance tools to be furnished the railroads for upkeep on feed-water heaters.

Causes of Defects in Castings of Complex Design

Handling of Mold at Time of Casting, Looking to Some Control of the Heat Treatment, Regarded as a Help in Solution of Problem

BY JAMES MCINTOSH

IN THE IRON AGE of Sept. 25, 1924, page 755, in the report of the convention of Ohio foundrymen, we read of "great loss from defective castings" and of \$32,000,000 per year going into scrap. This is said to be due to failure to regulate the sand used. But there are other reasons which are more potent, and that regardless of the care taken in the best regulated foundry.

The average modern cylinder block in an automobile engine is so complex in design and varied in thickness that it is, to say the least, far from a simple problem to produce it. Even assuming the mold and core problem is solved, it must be filled with metal sufficiently fluid to enter every point from a 5/32-in. jacket wall to a 1/8-in. cylinder barrel, to which are connected flanges and a further thickening for studs, etc.

We see a 6-in. and now an 8-in. cylinder in line and the overall length adds to the problem of casting it. Then, again, shrinkage is a factor. A hard core surrounded by a jacket wall is well calculated to cause a fracture due to shrinkage. In addition, there are the heavier internal barrel and flanges protected by red hot cores which retard the cooling long after the jacket walls have cooled off. This pulling and pushing tendency must be obviously a reason for making the cooling process a slow one to avoid distortion and fracture.

When the mold is ready for casting, its temperature may be said to be about uniform, and if the metal is of proper composition and temperature and caused to flow through the mold to the risers, about all has been done that can be done to produce ideal conditions in casting a cylinder block. The question now is: How can this casting be kept to its normal shape and yet cool off uniformly to avoid distortion? If that is impossible, every precaution against local cooling must be taken to avoid the exposure of a surface, except it be the interior of the cylinder bore, thus getting conditions tending to more uniform cooling.

Modern Cylinder Block a Monstrosity

When cannon were cast, the core for the bore was filled with pipes to circulate water after the gun was cast, with the result that the casting cooled from the inside outward. Thus the outer metal, being kept hot by the mold, was more likely to be effective in strengthening the gun due to the shrinking of the outer layers. I do not advocate circulating water through the barrel cores in an automobile cylinder block; but I want to give a few reasons why a cylinder block may fail at any one of several points between the rough casting and the cylinder block installed in an engine, fitted into an automobile and sold for a good one.

It is not going far astray to say that a modern cylinder block is a monstrosity as to design. If one expects to find ideal bores in a finished block when cold, let him realize that it must operate under conditions that tend to distort it—a different temperature at every point, combined with flanges, stud metal, etc.; points efficiently cooled and those not so cooled; metal that can conduct heat where it is not required, and highly heated surfaces that cause trouble in keeping

exhaust valves tight, with inlet valves and ports alongside tending to pull or push a casting every way but in the proper relation to its normal self.

Will the water jacket prevent these results? Let us consider that point.

On entering the jacket water will go where it finds the line of least resistance. It will go the shortest road and prefers a cool surface to a hot one. It will hug the surface of a cold frying pan, but not so with a hot one. Exhaust valves are hot; so are the seats—generally the hottest point outside of the upper end of the bores where the water is not effective due to a flange, stud metal, etc. All the above conditions exist in a cylinder block of the best design, cast under ideal conditions, the sand and material for cores properly vented, and the metal up to the S. A. E. standard as to analysis.

High-Pressure Methods Responsible

In the case of alloy steels, we find the S. A. E. defines several, while all the letters of the alphabet are used to designate the proper degrees of heat treatment for every contingency. There are elaborate tests to control the processes and the ultimate result in a finished product which operates at an atmospheric temperature, and yet in the case of a cylinder block the heat treatment may be anything from holding it a week-end in a mold to being dumped out red hot and left to fate, subject to any and all drafts, and to the whim of the irresponsible.

High-pressure methods are responsible for defective castings, due to the lack of time to produce a satisfactory mold or to detect a "brush" due to a defective or distorted core. This means loose sand is found where metal should be and a defective flange or hole in the jacket wall is the usual result. It has been said, "Necessity is the mother of invention." To reduce the percentage of scrap, the use of arc-welding has dispensed with the scrap hammer to the detriment of some one later on.

Assume a satisfactory design free from abnormal metal, the usual jacket wall thickness, bores and flanges plus finish being normal in a six-cylinder block cast in a modern foundry. Such a casting is dumped and "bumped" while still red hot. All or part of a thin water jacket wall is exposed while the heavier metal is incorporated in core sand equally hot. What is the result, due to unequal cooling in shrinkage? The jacket core, being surrounded by thin metal, may find relief in a fractured jacket wall in tension, so that the slightest jar may complete the job of fracture.

Under all the circumstances it seems to me that the solution of the scrap problem is to get out a specification as to the heat treatment of castings. In suggesting this I do not consider the suggestions that have been made concerning reheating a casting after it has left the foundry. That has always seemed like an attempt to make the matter better by a questionable method. "Cooling treatment" in a mold is more likely to prevent strains, fractures and distortion—the direct result of unequal cooling, which in turn is a natural and inherent defect in the conventional cylinder casting of complex design and proportion as to metal thickness.

A cylinder casting is of uniform temperature while

the metal is still fluid. Later care must be taken to avoid unequal contraction in the mold while it is cooling. It is finished at a nearly constant and uniform temperature. But it must be operated at temperatures changing every cycle and uniform at no two points. Percussion shocks and temperature strains are evident

in this most complex casting, and yet it is dumped out to its detriment before it has time to settle down and become useful.

Why this is tolerated is hard to explain. Conditions should be different. They can be if proper thought is taken.

German and French Metallurgical Equipment

Comparison Shows German Capacity in Both Pig Iron and Steel

**Much Above French—Loss of Alsace-Lorraine
Already Neutralized**

FULL utilization of the equipment of the metallurgical industries of France and Germany since the war has been greatly interfered with by political disturbances and by the abnormal conditions in world trade, according to Chester Lloyd Jones, Commercial Attaché at Paris. The degree to which equipment in Germany has been enlarged or new equipment created is not satisfactorily reported. It is, therefore, difficult to make a statement of the relative present strength of the two countries in iron and steel production. The report adds:

"A listing of the equipment now available, if it could be made accurately, would not be entirely satisfactory because such a list fails to indicate the differences between theoretical and actual capacity. It is probable that the German equipment can be used to at least as good advantage as any in the hands of the French and that a comparison on the basis of estimated existing equipment will not err on the side of estimating the relative French position too favorably."

Iron and Steel

"Before the war Germany had 316 blast furnaces, of which 85 were in Lorraine and the Saar and 231 in areas which have definitely remained German. Westphalia and the Rhine province contained 115. The reports of the French Commission at Essen indicate that in the latter areas there are now 117, the capacity of a number of which has been increased, and that further enlargement, involving 19 units, is in process in Westphalia.

"This equipment, it is estimated, will soon give the Ruhr alone a theoretical daily capacity of 44,000 tons of pig iron. On this basis, counting 300 days of operation per year, Westphalia alone could turn out yearly 13,000,000 tons of pig iron. Assuming a similar development to have gone on in other parts of Germany, where about 40 per cent of the blast furnaces are located, the theoretical production would soon reach 20,000,000 tons. This would exceed the 19,000,000 ton total produced in 1913, when Germany held Luxemburg, Lorraine and the Saar.

"The Comité des Forges reported the number of French blast furnaces in operation, repair or construction in 1912 at 162. The similar figure for August, 1924, was 220, including 68 in Alsace-Lorraine. The theoretical capacity of this equipment is currently stated to be between 10,000,000 and 11,000,000 tons per year, or about half the capacity of the German industry as estimated by the commission of French engineers above referred to.

"A similar comparison is made by French engineers as to the steel position. In 1913 Germany had 407 Martin (open-hearth) furnaces. Of these there were in 1923 in Westphalia and the Rhine province 342, of which 297 were in the Ruhr. Since about 66 per cent of the Martin steel produced in Germany came from this area in 1913, it is estimated that there are probably about 450 Martin furnaces in Germany at present. The productive capacity of the occupied area in the Ruhr and the Rhine districts was reported as 7495 tons per day in 1913. It is stated that it was 9772 tons of steel in 1923 and soon will be 10,552 tons.

"Counting in the enlarged capacity of some of the

older equipment and the new construction which has occurred, including that of electric furnaces, it is estimated that the steel-making capacity within the present German empire is approximately 20 per cent greater than before the war. In other words, the decrease of steel-making power through the loss of Luxemburg and Lorraine in the war (3,550,000 tons) appears already to have been made up.

"Comparison of the estimated steel-making equipment of Germany with that in France seems to indicate a relation not dissimilar to that between the pig iron producing capacities of the two countries."

Orders Placed by Mystic Iron Works

The Mystic Iron Works, Boston, has purchased additional equipment for its blast furnace plant at Everett, Mass., which, it is expected, will be completed in 1925. The open winter has permitted rapid progress both in the construction of furnace foundations and in dredging work, consequently contractors are fully up to schedules. Following are purchases of equipment, completed during the past week or ten days:

Three 65-ton short-pour hot metal ladles and trucks, with one spare ladle, three covers and one pair of pouring stands, from William B. Pollock Co., Youngstown.

Two 150 cu. ft. bottom dump scale cars and one 50-ton side dump ore transfer car, from Atlas Car & Mfg. Co., Cleveland.

One 7 ft. x 225 ft. and one 14 ft. x 225 ft. reinforced concrete chimney, lined to top with perforated radial brick, from Heine Chimney Co., Chicago.

One 458 cu. ft., 100-lb. motor driven air compressor; three 3000-gal. centrifugal pumps for pumping from the Mystic River to the condensers; two 4000-gal. centrifugal pumps for general plant service; two 2500-gal. centrifugal pumps for gas washer supply; and two 700-gal. centrifugal boiler feed pumps, from Ingersoll-Rand Co.

Two No. 40 and two No. 35 multi-jet condensers complete with atmospheric relief valves and spring supports, from Schutte & Koerting Co., Philadelphia.

Two 6900-hp. Stillwell open feed water heaters, from Worthington Pump & Machinery Corporation, Harrison, N. J.

One double strand pig casting machine, from Pittsburgh Coal Washer Co., Pittsburgh.

Three link chain stokers, from Combustion Engineering Corporation, New York.

One 22½-ton locomotive crane, from Industrial Works, Bay City, Mich.

One 20-ton power house Shaw crane and one 10-ton east house Shaw crane, from Manning, Maxwell & Moore, Inc.

One coke breeze skip hoist, from Link-Belt Co., Chicago.

The furnace and stove linings were purchased from the General Refractories Co. The furnace lining is to be of Olive Hill, Ky., brick, and the stove linings of Clearfield County, Pa., brick.

The 1924 edition of the tentative standards of the American Society for Testing Materials, which is issued annually, contains 763 pages and 185 tentative standards. Steel and wrought iron is the subject of 11 of these standards and 18 are devoted to non-ferrous metals. The rest cover such materials as cement, coal, coke, etc. The volume is available at \$7 in paper and \$8 in cloth binding, and the headquarters of the society are at 1315 Spruce Street, Philadelphia.

MACHINE TOOLS AND THE CENSUS

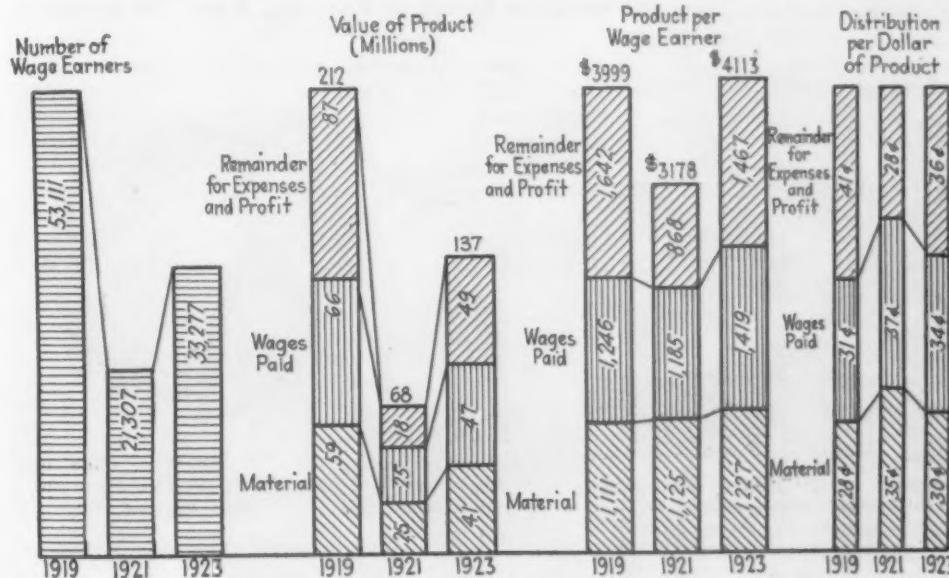
Analysis of 1919, 1921 and 1923 Figures Shows the Builder Badly Off

Graphic comparisons of the 1919, 1921 and 1923 census figures, covering the machine tool industry, have been made by Ernest F. DuBrul, general manager National Machine Tool Builders Association, Cincinnati. The comparison covers four principal features—the number of wage earners, the value of product, the amount of product per wage earner and the distribution of the cost of product per dollar of value. Under the three latter heads, each item is sub-divided into three parts, the cost of materials, the amount of wages paid and the remainder, which latter has to

It is interesting to note that in 1923 the product-per-wage-earner was \$114 more than in 1919, though the total volume had not recovered its 1919 level. Analysis shows, however, that material cost \$116 more than in 1919, and wages \$173 more, while the remainder was \$175 less per wage earner. So out of the higher value per wage earner the machine tool builder got that much less margin, and was employing only about 60 per cent of his 1919 force besides. Net profits depend on the volume of that margin, after paying all expenses. In 1919 that volume was \$87,000,000, in 1923 it was \$49,000,000, or only 56 per cent as much.

Distribution Per Dollar of Product

The fourth set of bars shows the relative distribution of each dollar of value produced in the three



Graphic Representation of the Three Most Recent Sets of Census Figures Concerning Machine Tools. In the analysis the study is made of the relation of output to number of wage earners and of the proportion remaining each year for expenses and profits after materials have been bought and wages paid

absorb all of the other manufacturing expenses and then to provide the profit, if any.

In each case the 1919 figure is given the same height in the diagram, this being the standard by which the two later census years are measured. The value of product in 1921 dropped lower than the relative number of wage earners in that same year, thus producing the drop in the product per wage earner, as shown in the third group. Commenting upon the diagrams, Mr. DuBrul makes the following remarks:

Value of Product

The bars showing value of product are cut up into the three main elements of cost; material, labor and the remainder for expense and profit. This shows how the expense and profit element took the main force of the blow that drove the value of product down in 1921. The relative shrinkage in expense and profits was much more than in the materials and labor, and the recovery in 1923 was less. Losses of 1921 in excess of the \$18,000,000 expense came out of previously accumulated capital. At best, 1923 must have been a year of rather slim profits for the industry as a whole, and 1924 was not so good as 1923.

Product Per Wage Earner

Consider now the third set of bars, that reduce all the data to a basis of wage earners employed. There was a shrinkage of that base in 1921 of over \$800. A little of that shrinkage was paid in wages, but most of it was in the remainder for expense and profit. It would be interesting to know to what extent this shrinkage was caused by prices made below reasonable costs in an attempt to stimulate the market. Was the loss caused by low production further increased by injudicious pricing?

census years. Out of each dollar of 1919, 28c. went for material, 31c. for wages, 41c. for expenses and profits. Out of each dollar of 1921, 37c. went for material, 37c. for labor and 28c. went toward expenses. Out of each dollar of 1923, 30c. went for material, 34c. for wages and 36c. for expenses and profit. So the industry was much poorer off in several ways. Out of each dollar it paid more for material and wages, it got less for expenses and profits, and received only 65 per cent as many dollars as it got in 1919.

Argentina Absorbs American Industrial Machinery

Argentina took 31 per cent more of American industrial machinery in the first six months of 1924 than in the first half of 1923, according to reports to the Department of Commerce. The latest figure shows \$2,632,896, compared with \$2,004,309 in the previous year. Increases were noted in mining, oil well and pumping machinery, which had declined since 1922, while large quantities of metal-working machinery, as well as construction, conveying and power generating machinery were sold. The railroads present a favorable opening for sales of machine tools and other machine shop equipment, as there are 23 railroads of importance, with about 24,000 miles of line.

In the report emphasis is placed upon the necessity for the American manufacturer to appoint a suitable agent in Buenos Aires, with enough capital to stock standard machines and to finance the larger shipments. If a European importing house in Argentina is to be used, the manufacturer should assure himself definitely that this importer handles no competing European line.

High-Load Capacity Claimed for Swedish Bearings

A line of disk and ball bearings designated as the NKA and for which high load-carrying capacity is claimed has been placed on the market by the Wollmar Engineering Corporation, 224 East Forty-second Street, New York, which is the American representative of Nordiska Kullager Aktiebolaget, Gothenburg, Sweden.

The disk bearing, shown in Fig. 1, is made up of two race rings, between which rollers having convex race surfaces and flat side surfaces are placed. A feature of the bearing is that the rollers are self-guiding, which feature may be understood by considering the rollers to be cut from an ellipsoid of rotation and placed between two flat surfaces as shown at Fig. 2. As long as this ellipsoid rolls on the smallest great circle the contact surfaces will be symmetrical to the points A and B. If, however, the disk tends to turn to the left in a plane at right angles to the plane of

lubricant to get in between the balls. The cage is flexible and resistant to wear and the balls may be inspected without taking the bearings apart. The ball race grooves are deep and close fit of the balls is intended to provide greater carrying capacity. The method of introducing the balls between the race rings is featured as permitting a large number of balls to be inserted into the bearing.

Knife Information Bureau Accused of Unfair Competition

WASHINGTON, Dec. 16.—Charged with being engaged in a combination and conspiracy to fix uniform sales prices and to suppress competition between and among members in the sale and distribution of machine knives, the Federal Trade Commission has issued an unfair competition complaint directed to the Knife Information Bureau, of Fitchburg, Mass. The bureau is



Fig. 1.—Disk Bearing With Self-Guiding Rollers

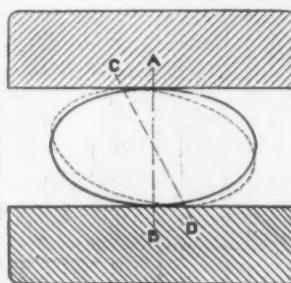


Fig. 2.—Diagram Illustrating Self Guiding Feature of Disks

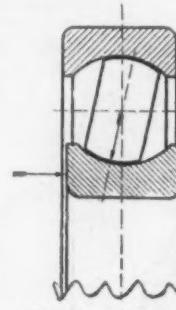


Fig. 3.—Position of Disks Under Axial Load

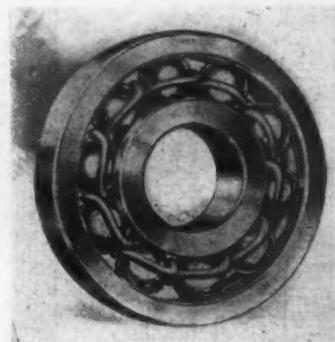


Fig. 4.—The Wire Cage or Separator Is the Feature of the Ball-Bearing

the paper, and the bearing continues to rotate, thereby giving the roller a turn in the plane of the paper, the section of the ellipsoid will appear as shown in the dotted line, and the points of contact moved to C and D. As these points are not opposite each other a moment is produced which will turn the roller to the right in the plane of the paper and be returned to its normal position.

This statical self-guiding, it is explained, is not, however, sufficient to produce even running of the rollers. When the bearing is subjected to radial pressure one half of the rollers will be without pressure, and statical self-guiding will not exist. Because of the slight width of the rollers the moment of inertia about the normal axis of rotation is greater than the moment of inertia about any other axis through the center of gravity of the rollers. Therefore, it is claimed, the rollers will also be dynamically self-guiding. Free rotating bodies always strive to rotate about the axis with the greatest moment of inertia.

When the disk bearing is subjected to axial pressure only the resultant force on every roller makes an angle with the axis of rotation of the bearing, and the rollers take the position shown in Fig. 3, thus reacting against the axial stresses. When this bearing is subjected to both axial and radial stresses the rollers in different positions have different angles of reaction, the degree of which is conditioned by the resultant force exerted upon them.

The shape of the rollers is said to permit a large number to be placed between the rings, the rollers being placed in position in the race grooves by twisting. The cage is designed to permit the rollers to be self-guiding.

A feature of the NKA ball bearing, which is available in both radial and thrust types, is the ball cage or separator. This cage is of spring steel wire, which is looped between each pair of balls, embracing a segment of each ball. This construction is emphasized as minimizing friction, taking up little space, and permitting

an unincorporated association of manufacturers of knives and cutting tools, and devices adopted to cutting machines and also paper mill bars, and machine bed plates.

In view of efforts on the part of Government officials, as well as business interests, to set up a specific code governing operations of trade associations, the complaint of the commission has created unusual interest. One of the phases of the complaint that has attracted attention is the charge that an effort is being made by the bureau through the so-called "reporting plan," to maintain prices.

The following are named individually and as members of the bureau in the commission's complaint: Knife Information Bureau, George Butterfield; E. C. Atkins & Co., Indianapolis; Bailey & Blendinger Mfg. Co., Woburn, Mass.; Dilts Machine Works, Fulton, N. Y.; R. J. Dowd Knife Works, Beloit, Wis.; A. Hankey & Co., Rochdale, Mass.; D. Lovejoy & Son, Lowell, Mass.; Mack Tool Co., Rochester, N. Y.; Ohio Knife Co., Cincinnati; Shartle Bros. Machine Co., Middletown, Ohio; Simonds Saw & Steel Co., Fitchburg, Mass.; A. A. Simonds-Dayton Co., Dayton, Ohio; Taylor, Stiles & Co., Riegelsville, N. J.; Wapakoneta Machine Co., Wapakoneta, Ohio; Worden Tool Co., Cleveland; L. & I. J. White Co., Buffalo, N. Y.

Plans for the sectional meeting of the American Society for Steel Treating, to be held at Cincinnati Jan. 15 and 16 were outlined at the meeting of the Cincinnati Chapter Dec. 11. W. S. Bidle, president-elect of the society, delivered an address on "Planning a Heat Treating Plant."

The annual meeting of the American Engineering Council will be held in Washington, Jan. 16 to 17, 1925. The administrative board of the council will convene Jan. 15 in that city.

IMPROVEMENT IN GERMANY

Taxation Occupies Many Minds—Iron and Steel Syndicates Not Yet International

BERLIN, GERMANY, Nov. 29.—The condition of industry is steadily improving. The number of unemployed in Germany declined between Oct. 1 and Nov. 1 from 513,500 to 435,150; and is therefore only about one-seventh of the 3,000,000 unemployed at the end of last year. The demand for heavy iron and steel, for billets, blooms, bars and some kinds of sheets, has greatly increased; and some manufacturers refuse to deliver in less than two months. In general, however, the iron and steel branch must be considered as still suffering from an excess of production capacity above the demand; so that the Steel Syndicate formed early this month will have real functions to perform.

Taxation

The Government's attempt, begun in August, to cut down industrial production costs by reductions in taxation and in railroad freight rates has not succeeded. The price indexes have fluctuated but not on the whole sunken; and the increased price of food has offset drops in other prices. The influential Hansa Bund business men's association declares in a petition to the Government that the reductions in federal taxes must be followed by reductions in state and municipal taxes.

Stahl und Eisen gives the following statement of certain public burdens falling directly or indirectly on machine tools, in percentage of a machine tool's value: Turnover tax 2½ per cent, income tax 1½ per cent, industrial tax (local) 1.25 per cent, wages tax 0.375 per cent, real estate tax 0.142 per cent, rents tax 0.215 per cent, export duties 3 per cent, Chamber of Commerce dues 0.150 per cent, social insurance 1.5 per cent. [These aggregate about 10½ per cent.] To these must be added the state and municipal ordinary taxes.

Syndicates

The trust and cartel movement is still making progress in the iron and iron-using branches. Reasons for this are the continued belief that selling capacity henceforth will fall permanently below producing capacity, and that the only solution is to ration orders and as far as possible to close down inefficient and uneconomic works, compensating their owners out of the profits of the efficient works. There is also an increased tendency to create joint selling organizations. The Solingen fine steel concerns, which hitherto have acted independently toward exports, are negotiating for centralization of sales, and for a single cooperative selling organization all over the world. Activity in this branch has increased, and the number of unemployed has fallen to 1000.

In connection with reports concerning the American aluminum trust, Germany's own aluminum trust (the Vereinigte Aluminiumwerke A.G.) appears prominently in the press. This organization runs a vigorous agitation in favor of prohibitive import duties for what is called "Germany's newest industry." The production of raw aluminum is practically a war industry. The Vereinigte Aluminiumwerke Co. embraces all producing concerns, with the exception of a small Swiss company in Rheinfelden. An almost complete monopoly prevails, owing to the fact of import prohibition on raw aluminum and that no new aluminum works may be founded on German soil without federal sanction. The Federal Government is at the head of the trust and is the chief stockholder.

Very high prices for raw aluminum are charged, and big profits have been reaped. For 1923 a dividend of 4 gold marks per paper mark share was declared, which is an effective yield of 400,000,000 per cent. Aluminum-consuming manufacturers, complaining bitterly, have joined the new Metalwares Association. German private trusts and cartels are mostly not monopolistic nor despotic, and they provoke no public animosity. It is therefore commented on as significant that the one injurious German trust should be largely

State-owned and almost wholly managed in the State's interest.

No International Combine Yet

No further progress has been made toward expanding the new German Steel Syndicate into a European combine. Rhenish-Westphalian opinion has become less favorable, as the emancipation of Germany from the economic shackles imposed by the peace treaty is imminent. After Jan. 10 Germany will be free. She sees no need for hurrying into a steel agreement with France. The Essen *Berkwerks-Zeitung*, the local organ of the "heavy industry," proclaims that it is France which has urgent need of an international steel syndicate. It is the Alsace-Lorraine iron and steel works, now owned by her, which are the chief factor of overproduction in Europe; and as she cannot be expected to close them down, she must needs seek an all-around agreement for limitation of output.

Prices have of late changed little, but any tendency there is upward. Pig iron was this week raised 4 marks per metric ton, but only in South Germany. Other latest prices (in marks per metric ton, with American equivalents, per gross ton or per lb.) are:

Ingots	100	\$24.20
Blooms	105	25.41
Billets	110 to 112	\$26.62 to 27.10
Slabs	117	28.31
Wire rods	136	32.67
		Per Lb.
Bars	122	1.37c.
Structural forms	117	1.26c.
Bands	155	1.67c.
Thick sheets (over 5 mm. or No. 6½ gage)	185 to 198	1.46c. to 1.49c.
Medium sheets (3 to 5 mm. or 11½ to 6½ gage)	150	1.62c.
Thin sheets (1 to 3 mm. or 19½ to 11½ gage)	180	1.95c.
Thin sheets (under 1 mm. or 19½ gage)	1.95	2.11c.

Industries which consume sheets and plates, including tin plate, ascribe their unsatisfactory condition to the policy of the producers. The Consumers' Association complains that, whereas exported German goods containing sheets or tin plate fetch 25 to 30 per cent above peace prices, the sheets and tin plate themselves cost 55 to 60 per cent above peace prices. Conditions in the market for bars improved until the third week of November, after which followed a slight setback. For highest-class precision machine tools there is a good home demand, also for twist drills. From abroad come inquiries but little export business is done. Certain kinds of machines and some railroad materials are going to Russia and Jugoslavia, the latter on reparations account. Locomotives of large size are being built for the Danish Government.

Automobile manufacturers continue to press for prohibitive import duties; but dealers and representatives of the public resolutely oppose. The president of the Auto Dealers Association publishes calculations to show that the German Government's proposed duties on cars would amount to 1800 gold marks, or \$450, on a cheap Ford car; and adds that the Government plan would operate merely to protect technically backward German concerns. The *Berliner Tageblatt*, after showing that the cheapest German car costs per kilo four times as much as the cheapest American, gives instances of German backwardness.

American Weights Best by Test

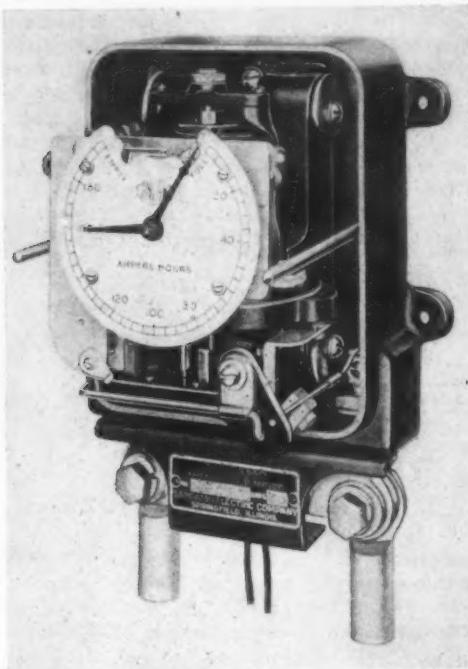
That laboratory weights of American manufacture are more accurate on the average than those imported from abroad is shown by the records of tests made by the Bureau of Standards. One American manufacturer submitted nearly a thousand such weights for test during the year, none of which were rejected for inaccuracy. Two others had no rejections, but had submitted smaller numbers of weights, while with other manufacturers from 3 to 10 per cent of weights were rejected.

In the imported sets tested, on the other hand, it was found necessary to reject from 4 to 50 per cent of the weights for not being sufficiently accurate, besides which a large number were rejected because of imperfections of material or structure. These weights are of the class known as analytical weights.

Amperehour Meter for Motive-Power Service

Simplicity of construction is a feature of the amperehour meter illustrated, which is designated as the type NT and is intended for use on electric industrial tractors, mine locomotives, trucks and in other motive power service.

The instrument, which is a recent addition to the line of the Sangamo Electric Co., Springfield, Ill., indicates the amount that the battery has discharged by means of the black hand on the dial. By comparing



Amperehour Meter with Cover and Train Removed. The amount of battery charge is indicated on the dial

the position of the black hand with a red hand, which is set at the point where the battery should be recharged, the operator may note what remaining capacity is available before the battery should be put on charge. This guards the vehicle from being stalled in service. When the vehicle is placed on charge, the meter permits of giving the battery the proper overcharge, and automatically opens the charging circuit at the proper time, thus eliminating the need for attendance. The instrument is adapted also to the control of batteries requiring two-rate charging.

The meter operates on the mercury-motor principle. One set of permanent magnets provides both the driving and damping flux and eliminates the need of a separate damping disk. The only exposed moving parts are a short section of the spindle and a small counterweight, and the mercury flotation of the moving element is said to eliminate bearing troubles. The armature box is of molded insulation, which is treated to retard the formation of dross. A non-spilling mercury chamber is said to prevent the leaking of the mercury regardless of how the meter is handled. The adjustment of the meter is simple, being obtained by means of a single slider which may be clamped in position, thus assuring permanence of calibration. A variable resistor element with a calibrated scale is provided to give the battery automatically the required excess of charge over discharge.

Anthracite production of the United States for 1924 through Dec. 6 is estimated at 84,652,000 net tons, compared with 87,952,000 net tons in the corresponding period of last year, according to figures of the United States Geological Survey. The figure for the week ended Dec. 6 is given as 1,814,000 tons, compared with 1,611,000 tons in the preceding week and with 1,837,000 tons in the corresponding week of 1923.

Gases in Charcoal and Coke Cast Iron

A report was recently made by W. E. Jominy of the University of Michigan on a comparison of some of the properties of charcoal and coke gray cast irons. His report shows that the average values for Brinell hardness, transverse strength, tensile strength and deflection for a considerable number of heats of charcoal irons are appreciably higher than for a similar number of coke irons of closely comparable chemical composition. Such differences did not disappear on a remelting of the cast irons. Some years ago J. E. Johnson, Jr., stated that similar differences in strength of cast irons were due to differences in the oxygen content of the metal. The Bureau of Standards has been supplied with samples of most of the irons listed by Mr. Jominy and will make analyses for oxygen by the vacuum fusion method in the attempt to throw some light on the supposed influence of oxygen in such material.

Record Portland Cement Production

Production of Portland cement in November is given as 13,141,000 bbl., compared with 14,820,000 bbl. in October and with 12,603,000 bbl. in November, 1923. The total for 11 months this year, 138,424,000 bbl., is greater than the entire output for 12 months of 1923 at 137,460,238 bbl., which was the greatest year's production on record. For 11 months last year production amounted to 127,463,000 bbl.

Shipments fell off heavily in November, being 10,289,000 bbl., compared with the high record shipments of 17,081,000 bbl. in October. They were slightly higher, however, than the 10,251,000 bbl. in November, 1923. For the 11 months, shipments aggregated 140,162,000 bbl., compared with 135,912,118 bbl. for all of 1923 and with 129,504,000 bbl. in the 11 months of 1923. The present figures constitute a new record. Stocks at the end of November aggregated 8,927,000 bbl., compared with 6,073,000 bbl. the end of October and with 6,991,000 bbl. Nov. 30, 1923.

November Bookings of Independent Sheet Makers Set New High Record

Last month's bookings of sheets by the independent manufacturers reporting to the National Association of Sheet and Tin Plate Manufacturers were 462,709 net tons and were far and away the highest sales ever made in any one month. The last previous record was established in December, 1922, with bookings of slightly in excess of 394,000 tons. Last month's even exceeded those of the two previous months combined and as both production and shipments were somewhat lighter than in October, due to the fewer number of working days, unfilled obligations mounted heavily, standing at 531,815 tons at the end of November. The figures are those of manufacturers operating 503 mills, or 94.8 per cent of the independent capacity, the total number of mills in the United States being 686, which for November, based on the number of working turns possible, had a capacity of 384,000 tons. Mills reporting had a capacity, based on working turns, of 282,100, which is 73.5 per cent of the total capacity.

The report for November, compares with that for October and September in net tons, figures in parentheses being the percentage of capacity of manufacturers reporting, as follows:

	November	October	September
Capacity	384,000	431,000	413,000
Per cent reporting	73.5	72.6	70.0
Sales	462,709(164)	221,773(70.7)	227,520(79.0)
Production	224,931(79.7)	274,222(78.9)	217,981(75.7)
Shipments	219,228(77.7)	229,771(73.3)	190,210(66.0)
Unfilled tonnage	531,845(188.5)	275,593(88.0)	274,325(95.2)
Unshipped stocks	76,811(27.2)	75,862(24.2)	81,576(28.3)
Unsold stocks	41,573(14.7)	42,685(13.6)	43,001(14.9)

Foundry operations at the Auburn, N. Y., plant of the McIntosh-Seymour Co., manufacturer of Diesel engines, are being resumed, after a shutdown of seven months. By Jan. 1, it is expected to have the plant running at full capacity.

MORE ACTIVITY AT SEATTLE

Buying of Steel Products Shows Decided Increase with Some Price Advances

SEATTLE, Dec. 12.—The greater activity in demand for all kinds of steel products, firmness in prices, with advances on some lines are the leading features in the Seattle and nearby markets. These improved conditions started to show themselves about two weeks after the election, and since that time there has been steady betterment in the local steel situation. Indications all point to an active first quarter at least.

Like in all sections of the country, stocks of steel goods carried by Seattle jobbers and consumers were extremely low. Increase in buying did not begin until the election result was known. Then the buying movement started and is now going on in a very satisfactory manner.

Local sales managers of a number of the larger Eastern steel companies report that in the last three weeks or so they have entered more new orders, and have received specifications on old contracts to a greater amount than in the preceding three or four months.

Local steel prices are very firm, and the advances in wire products, sheets, shafting and other steel products made in the past two weeks by Eastern mills are also in force in the local market, the mills that made these advances having notified their local sales agents that these advances apply on any orders taken here. As usual in an advancing market, favored customers here of Eastern mills were given a chance to cover before the advances were made, and in practically all cases they took advantage of it, but this was restricted by the mills to material for delivery in first quarter only.

Local prices on structural shapes are up about \$3 to \$4 per ton, the minimum being 2.35c., with two Eastern mills refusing to accept orders under 2.40c., f.o.b. Seattle delivery. However, low prices are still being quoted on any work coming up, as was done on 4000 tons of bridge work for the Government railroad in Alaska, this having gone to the American Bridge Co.

An inquiry is in the market for a bridge on Beacon Hill in this city, about 350 tons, bids on which will be opened next week.

Demand for plates is quiet, but prices are very strong, the minimum now being 2.40c., Seattle delivery, an advance of \$3 per ton over the low prices ruling in the summer months. Orders are mostly for small lots, the city of Seattle having been a fairly large buyer for some time for city work. No large work is in sight at present, a good deal of contemplated work having been put off until next spring.

Sheets are one of the most active items here on the whole list of steel products, large consumers having bought freely before the recent advance in prices was made, and shipping directions on much of this tonnage have been given, deliveries running over the first quarter. On new orders, all the local sellers are quoting firmly on the basis of \$4.75 for galvanized, \$3.60 for black and \$2.70 for blue annealed.

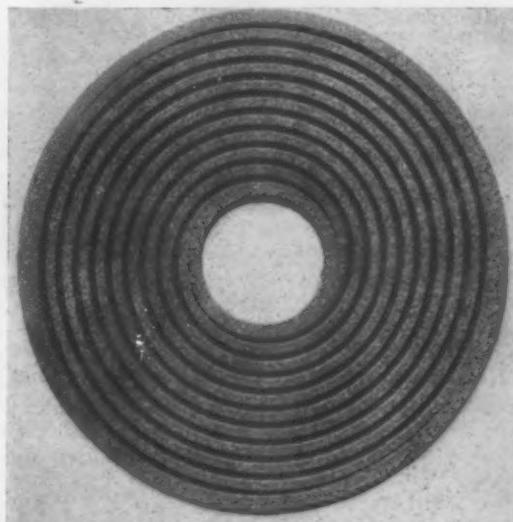
Considerable inquiry for shafting is developing in the local market, the representative of a Pittsburgh mill having closed several good orders in the past week on the basis of \$3.80, f.o.b. Seattle, this price being based on \$2.80, Chicago, with a freight rate of \$1 to Seattle from Chicago.

In merchant steel bars, Eastern mills are practically shut out of this market, owing to the high freight rates, and the fact that the local Pacific Coast Steel Co. is offering steel bars at 2.50c., delivered in buyer's warehouse. Some Eastern mills are offering steel bars at 2.40c., Seattle, but with charges after they get here for dockage and hauling, this price is higher than that of the local maker, and in addition, deliveries from the local mill can be had in several hours by use of the telephone.

Recently J. F. Clarkson, a contractor of Portland, Ore., secured a contract from the Eastern & Western Lumber Co. for the construction of 15 miles of standard trackage to open up some timber lands owned by the latter, and it is said that a contract for the rails was placed with a German mill, 60-lb. sections, at a price of \$36 per ton, delivered Portland, duty being paid. The freight rate from the mill to point of delivery was \$3 per ton.

Spiral Abrasive Disk

A spiral abrasive disk known as the Titan and which is claimed to be especially adapted for grinding large surfaces and for thin work which is easily heated and warped.



Spiral Abrasive Disk Especially Adapted for Grinding Large Surfaces and Also Thin Pieces that Are Easily Heated and Warped

warped, has been developed by Charles H. Besly & Co., 118 North Clinton Street, Chicago. These disks may be used for wet grinding providing waterproof cement is employed for attaching them to the disk wheel.

In the new disk, which is illustrated herewith, the abrasive grains are held together by means of cement bond. The disk is made up of ridges of abrasive grain with intervening clearance spaces, the clearance grooves being started in two places directly opposite each other so the disk will be properly balanced. These clearance grooves run practically down to the cloth, and the width of abrasive as well as the width of the clearance groove can be varied depending on the work to be done.

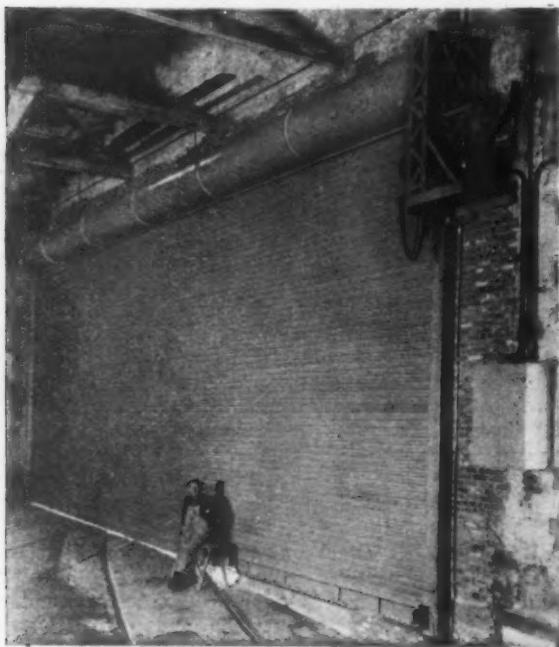
It is claimed that the abrasive grain being applied in the form of spiral ridges produces a shearing effect which greatly increases the cutting quality of the disk. The clearance grooves are said to permit the grindings to escape, thereby preventing the work from heating, as friction in disk grinding is caused by the removed particles of metal following around the disk. The spiral disk is further said to work much better than the standard disk when grinding malleable iron, cast steel and other metal of tough, stringy nature. In grinding large surfaces with the spiral disk there are less cutting points presented to the work and less pressure is said to be required to make the abrasive grains bite or take hold.

Estimates place the expenditures by primary and secondary iron and steel interests in the Mahoning and Shenango valleys at \$18,000,000 this year for renewals, maintenance, modernization and enlargements. Leading in this work are the Youngstown Sheet & Tube Co., the Republic Iron & Steel Co., the Carnegie Steel Co., the Trumbull Steel Co. and the Truscon Steel Co. At its Ohio works in Youngstown, the Carnegie company is rebuilding No. 1 blast furnace at a cost in excess of \$1,000,000, and the work is well advanced.

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The door is made up of No. 16-gage galvanized interlocking steel slats, and travels in heavy built-up channel-shaped steel side guides 9 in. deep, one on either jamb. The door coils around an overhead hori-



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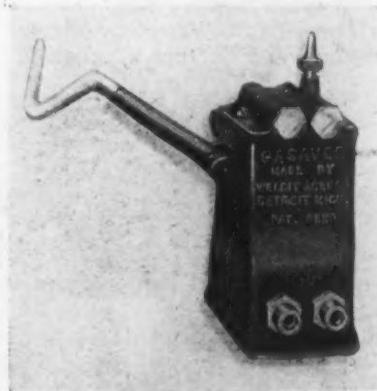
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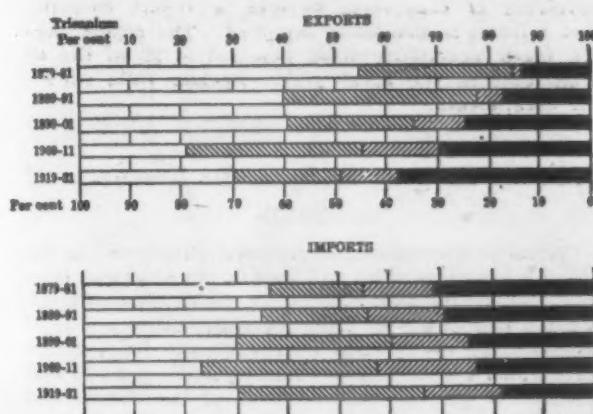
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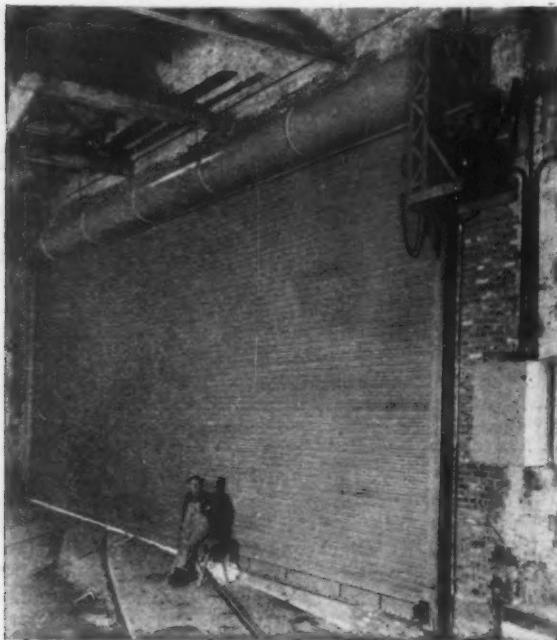
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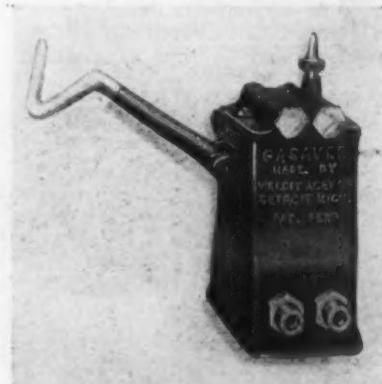
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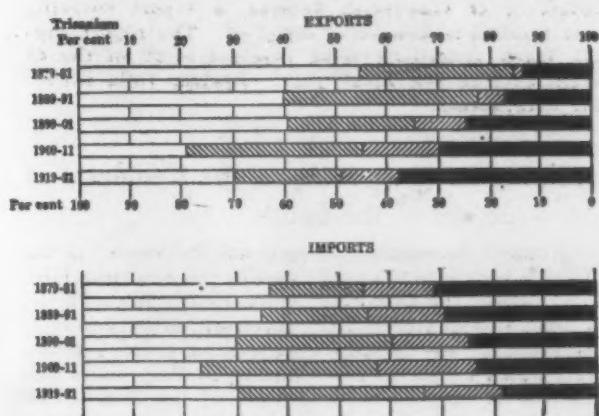
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ucts, and displays the historical movement of those products as a basis for judging their future movements. A comprehensive bibliography covers more than 20 pages, while the unusually complete index, elaborately cross-indexed, fills no less than 63 pages, or one-eighth of the entire book.

S. G. K.

Metallurgy of Copper. By the late Dr. H. O. Hofman, professor of metallurgy, Massachusetts Institute of Technology, revised by Carle R. Hayward, associate professor of metallurgy, Massachusetts Institute of Technology. Pages 409, 6 x 9 in., 295 illustrations. Published by McGraw-Hill Book Co., Tenth Avenue and Thirty-sixth Street, New York. Price, \$5.

The revision of Metallurgy of Copper was imperative because of the changes in the practice of treating ores and the improvement in the apparatus used in carrying out the operations in the production and refining of copper.

Chapters I and II cover briefly the history of copper production in this country, statistics, and the physical and chemical properties of copper. Chapter III treats of the various grades of copper used in manufacturing. It enumerates the impurities and their effects on the properties of commercial copper. Chapters IV, V and VI give a short review of copper alloys, the common compounds of copper and copper ores.

Chapter VII treats comprehensively the smelting of copper. It gives considerable space to roasting and sintering and describes the apparatus used. The author discusses both the blast and reverberatory furnaces and describes the accessories for charging them and disposing of the matte, slag, speiss, flue dust, fume and gases. There is a discussion of the three kinds of smelting in blast furnaces, viz., reducing, pyritic and partial pyritic. Conversion of the mattes, which is an important operation, commands a discussion of 40 pages describing the two types of converters now in almost general use, the Great Falls and Peirce-Smith. There are 13 pages devoted to the recovery and reclamation of flue dust and fume which is done chiefly by large flues with baffles and the Cottrell treater. The author outlines a general arrangement for a sulphide copper smelting plant. He gives also a brief description of the smelting of oxidized and native copper ores, describing the various operations of the process and the different pieces of apparatus used.

Chapter VIII gives a good outline of the leaching of copper from several classes of ores. It takes up the various solvents and precipitants used and gives typical chemical reactions, outlining the procedure. Then it describes the two large leaching operations which are at Ajo, Arizona, and Chuquicamata, Chile. It refers also to several plants and locations where leaching is done.

Chapter IX outlines the metallurgy of copper in a general way. It discusses the two systems, viz., multiple and series, giving a brief comparison. It describes also the different operations and methods of handling the various materials. It devotes 10 pages to the treatment of the anode mud which contains the precious metals and most of the impurities contained in the anode copper.

Chapter X gives approximations of the cost of the major operations described in the treatise.

This volume contains an abundance of bibliography, mostly referring to contributions to the metallurgical and chemical organizations and scientific publications. The cuts and diagrams are well selected to illustrate the apparatus used in the smelting and refining of copper. There are many tables and data representing the work of some of the largest and best equipped plants, which are valuable to everyone interested in the metallurgy of copper.

The Association of Railway Executives announces that during 1925 the railroads of this country will spend approximately \$1,100,000,000 for new equipment and improvements in addition to the \$2,136,000,000 authorized during the last two years.

MANY DERAILMENTS

Bureau of Safety Calls Attention to Broken Rails
as Cause of Accidents

WASHINGTON, Dec. 16.—Importance of investigations of rail failures is emphasized by the remarkable increase in the number of derailments in recent years, according to the report of the Bureau of Safety of the Interstate Commerce Commission, covering the fiscal year ended June 30, 1924. Previous to 1908, it is stated, collisions were the more numerous class of train accidents shown in the commission's statistics. In 1908 derailments outnumbered collisions for the first time, there being 6671 reported for that year as against 6363 collisions. In every year since 1908, the report says, derailments have outnumbered collisions, the peak year coming in 1920, when the number totaled 22,477 as compared with 10,110. In 1923 there were 16,708 derailments and 7115 collisions.

Director W. P. Borland, of the bureau, after stating that investigation of rail failures has been continuing during the past year, says that a 33-ft. rail of a 90-lb. section has been secured, in which a total of 51 transverse fissures have thus far been discovered. Sample sections of this rail containing one or more transverse fissures have been furnished five laboratories or railroads and steel mills, and independent examinations are being concurrently made to determine if possible, what peculiar condition, if any, exists at the nucleus of a transverse fissure to which its formation is attributable.

Supplementing the report on the formation and prevalence of transverse fissures, a report covering other failures is now being compiled. The report says that track conditions were involved in 22 of the 48 derailments in the fiscal year. Broken rails caused four derailments.

A Mining Congress Book on the Resources of the South

"Natural Resources and National Problems" is the title of a book soon to be published by the American Mining Congress, the author being Dr. Henry Mace Payne, its consulting engineer. In a foreword, Secretary J. F. Callbreath of the Mining Congress says Dr. Payne's work, which will be in two volumes, is designed to call attention to the mineral resources of the South, and "to point the way to the manufacturer who is looking for new markets, new sources of raw material, better labor, and cheaper power."

The first volume summarizes the resources of the Southern mineral empire, and discusses current economic problems upon whose solution their development depends. The second volume deals with each separate mineral, its uses, the transportation facilities, competing markets, and sources of supply. It is stated that it is the aim of the American Mining Congress to assist in bringing to the South additional capital necessary to the more complete utilization of this mineral wealth.

The 1924 edition of standards of the American Society for Testing Materials comprises 1230 pages covering 220 standards. The largest number of these, 73, is devoted to steel, cast iron and wrought iron, and 39 embrace non-ferrous metals. There are seven devoted to coal and coke and 19 to preservative coatings for steel and other metals, the remainder covering miscellaneous subjects. The volume is available from the headquarters of the society at 1315 Spruce Street, Philadelphia, for \$11 in cloth and \$12.50 in half-leather binding.

The northern tier of the New England States showed little change in industrial conditions last month, but Massachusetts, Rhode Island and Connecticut each showed some improvement, it is said, in the monthly survey of the United States employment service of the Department of Labor.

High-Frequency Inductive Heating

Interesting Application Where Sections of Bars or Rods Must Be Heated to High Temperatures in Electric Furnace

BY DUDLEY WILCOX*

TWO melts made recently in an Ajax-Northrup high-frequency induction furnace are of interest because the furnace arrangement offers possibilities of performing operations impossible by any other method of heating. A piece of cold-rolled steel about $1\frac{1}{2}$ in. in diameter by $3\frac{1}{2}$ in. long was embedded in zircon sand within a tubular copper helix. The terminals of the tube were fitted with rubber hose for passing cooling water through the tubing. High-frequency current passed through the helix at a frequency of about 20,000 cycles per sec.

In this furnace the charge is heated by currents induced in it. There is no electrical contact between the source of power and the charge to be heated. A strong magnetic field is set up within a helical coil of copper tubing carrying high-frequency current. The rapidly alternating field permeates, without heating, all non-conducting materials within the coil, but sets up induced currents which heat any conducting material. The larger the conducting piece with reference to the coil surrounding it, the greater is the heating effect produced. The following data tell their own story:

Time	Kw. Primary Input	High Frequency Amperes	Notes
2.41	20	153	Iron wire indicator used
2.42	20	148	
2.43	20	168	
2.44 $\frac{1}{2}$	20	166	Melt weighted $1\frac{1}{4}$ lb.
2.45	20	165	
2.46	20	165	
2.47	20	167	
2.48	20	166	Melted
2.50	20	165	Stopped. 9 min.

Notes: Kw., when coil was empty 9.9 Current held
Kw., put into melt 10.1 constant

The illustration shows the iron wire indicator referred to. The wire, with the weight on top of it, was stuck down into the zircon sand and the tip of the wire rested against the top of the piece of cold-rolled steel to be melted.

The idea was to observe when the weight fell and to mark this as the time when the steel was completely melted. That the device worked well is attested by the tip of the wire showing at the side of the ingot. The wire went into the molten ingot as soon as fusion occurred. A piece of the wire went clear through and into the zircon sand at the side of the ingot. As the sand was comparatively cold and the wire was cold just before it went through the ingot, and as the power was turned off just after the wire and weight descended, the wire was not melted off but remained attached to the ingot. It thus gives the appearance of having pierced the cold ingot and makes an unusual exhibit.

A melt of another steel cylinder, larger than the first, is referred to in the following tabulation:

Time	Kw.	High Frequency Amperes	Notes
3.00	15	104	Started cold
3.05	15	122	
3.10	15	127	
3.15	15	128	
3.20	15	127	
3.25	15	125	
3.30	15	125	{ Steel all melted, superheating
3.33	15		

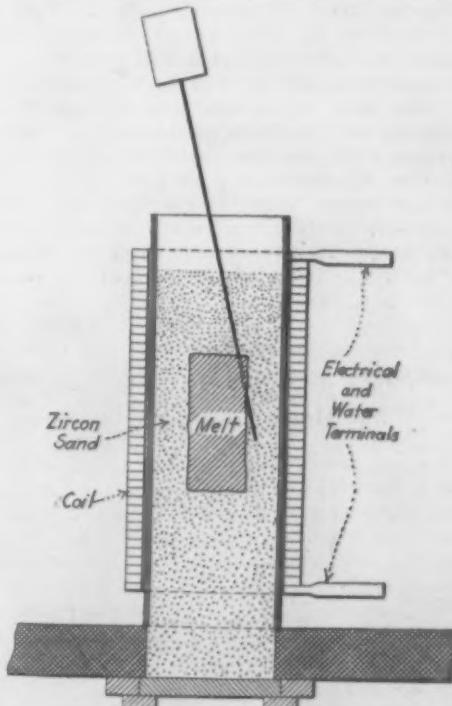
Notes: Kwhr. to melt, 7.5
Lb. per kwhr, 1.22
Total weight of melt, 9 lb. $3\frac{1}{4}$ oz.
Dimensions of steel cylinder—Length 7 in., Diameter $2\frac{1}{2}$ in.

It is thought that there is no other way in which this could be accomplished. An arc would heat the piece in one or more spots. An effort to melt the piece by passing a current through it would result in uneven

heating because the contacts would carry away much of the heat developed. A flame could not be applied to the piece without heating all the refractory material around the piece so that the refractory would attain at least as high a temperature as the piece.

The principle is applicable to many heating operations in which sections of bars, rods, etc., must be heated to a high temperature. Sometimes rods are welded together by heating the two ends to the melting point.

The coil is small and light and can be attached to automatic machines to heat stock as it travels through.



Section of Electric Induction Furnace Used, Showing Position of Indicator, after the Melt Was Completed

The coil can be set vertically or horizontally or in a diagonal position. Coils can be made in special shapes to fit closely around pieces to be heated. Coils with flexible leads can be easily arranged to move along with a piece of traveling stock so as to prolong the heating period of a section, the coil afterward being returned rapidly to its original position to heat another section.

A mechanical exhibition is being held this week in the show rooms of the Vonnegut Machinery Co., 19 West South Street, Indianapolis, for the purpose of "demonstrating to industrial Indiana just how Indianapolis can serve them." Motor driven machine tools are shown in operation, together with power transmission machinery and small tools.

Asbestos products to the value of \$12,270,205 were produced in the United States in 1923, compared with \$5,858,870 in 1921, these figures excluding asbestos textile products. There were 26 establishments operating in 1923, with 2005 wage-earners, against 15 establishments in 1921, with 948 wage-earners.

*Ajax Electrothermic Corporation, Trenton, N. J.

PARTNERSHIP INDORSED

Russell Sage Foundation Recommends Bleachery Plan to Other Industries

A partnership plan which gives the employees of an industrial property a share in management and profits, equal in many respects to that enjoyed by the owners, is suggested for the consideration of industry generally in a report on "Sharing Management with the Workers," just issued by the Russell Sage Foundation, New York. The report is based on a study of the partnership plan of the Dutchess Bleachery, Inc., at Wappingers Falls, N. Y., which, in the opinion of Mary Van Kleeck, director of the department of industrial studies of the foundation, is "one of the most significant of the several hundred current experiments in giving workmen a share in the management of business."

In making the report public, Miss Van Kleeck said: "The Dutchess Bleachery experience indicates affirmative answers to the much discussed questions: Is it financially safe for a company to permit its wage-earning employees to vote on questions of shop management? Do workers desire to have this share of responsibility? Lacking technical training and experience in administration, is their judgment valuable concerning questions of general policy? Will they have consideration for the interests of stockholders? The further point is made that in this case, when given power to determine policies, the employees did not use it to advance their own wages and decrease working hours regardless of the financial state of the business."

The report itself, a document of 150 pages, was prepared by Ben M. Selekman, a member of the foundation's staff, who conducted the investigation.

"The significance of this experiment, in so far as industry generally is concerned," declared Miss Van Kleeck, "lies in the fact that the partnership plan was

introduced under such unfavorable conditions in the Dutchess Bleachery that its success in this plant indicates the possibility of securing equally, if not more, favorable results in almost any industrial property through equally sincere and efficient efforts."

Mr. Selekman found that the partnership plan of the Dutchess Bleachery not only affords representation to employees in determining the conditions of their employment, but admits a representative of the wage-earners in the mill to the board of directors, turns over entirely to a board of workmen the administration of the company's houses for employees' families, assigns definite responsibility for shop management to a board of managers composed of six officers of the company and of six wage-earners, and provides employees with information concerning the financial condition and conduct of the business.

Other Reports Coming

The publication of this report reveals that the Russell Sage Foundation has had underway since 1919 a series of investigations covering, in addition to the partnership plan of the Dutchess Bleachery, the Rockefeller plan of employees' representation as practised in the steel mills and coal mines of the Colorado Fuel & Iron Co., the works council plan of the United States Government arsenal at Rock Island, Ill., and the employment policies of William Filene's Sons Co. in its store in Boston. The report of the foundation's investigation into the workings of the Rockefeller plan of employees' representation—the next in the series—will be issued probably within a month.

This series of studies was undertaken after interviews with a number of outstanding engineers, social workers, investigators, Government officials, employers, and representatives of labor, whose advice had been sought as to how the foundation could most effectively contribute toward the improvement of human relations.

Standard Sizes of Concrete Bars Adopted by Many Interests

The United States Department of Commerce has given out a list of 78 steel mills, concrete bar dealers, architects, bureaus and associations which have accepted the department's recommendation for 11 standard sizes for reinforcing bars. The list of standard sizes was published in THE IRON AGE of Dec. 4, page 1472. The names of those who have accepted these sizes are as follows:

American Railway Association
 American Society for Municipal Improvements
 American Society for Testing Materials
 American Specification Institute
 American System of Reinforcing, Chicago
 Andrews Steel Co., Newport, Ky.
 Associated Factory Mutual Fire Ins. Co.'s
 Associated General Contractors of America
 Atlantic Steel Co., Atlanta, Ga.
 Bethlehem Steel Co., Bethlehem, Pa.
 Building Officials Conference
 Carnegie Steel Co., Pittsburgh
 Concrete Steel Co., New York
 Concrete Engineering Co., Omaha, Neb.
 Gabriel Steel Co., Detroit
 Hugh J. Baker & Co., Indianapolis
 Illinois Steel Co., Chicago
 Inland Steel Co., Chicago
 Interstate Iron & Steel Co., Chicago
 Jones & Laughlin Steel Corporation, Pittsburgh
 Kalman Steel Co., Chicago
 Minneapolis Steel & Machinery Co., Minneapolis
 National Association Building Trades Employers
 Omaha Steel Works, Omaha, Neb.
 Pittsburgh-Des Moines Co., Pittsburgh
 Pollak Steel Co., Cincinnati
 Republic Iron & Steel Co., Youngstown, Ohio
 Stracy Schmidt Mfg. Co.
 Structural Service Bureau
 Truscon Steel Co., Youngstown, Ohio
 Youngstown Sheet & Tube Co., Youngstown, Ohio
 U. S. Bureau of Standards, Washington
 Federal Specifications Board

Office of Chief of Engineers, War Department, Washington
 U. S. Treasury Department, Washington
 Olney J. Dean & Co., Chicago
 Barton Spider Web System Co., Chicago
 American Car & Foundry Co., New York
 Gulf States Steel Co., Birmingham, Ala.
 Igoe Brothers, New York
 Kansas City Bolt & Nut Co., Sheffield Steel Mills, Kansas City, Mo.
 Knoxville Iron Co., Knoxville, Tenn.
 J. K. Larkin & Co., Inc., New York
 Pardee Steel Corporation, Perth Amboy, N. J.
 Republic Structural Iron Works, Cleveland
 Bureau of Reclamation
 Iowa State Highway Commission
 American Telephone and Telegraph Co., New York
 Board of Education, St. Louis
 City of New York, Department of Purchase
 Sullivan W. Jones, State architect, New York
 The Panama Canal
 Turner Construction Co., New York
 Dudley Bar Co., Birmingham
 American Railway Engineering Association
 Maryland Steel Products Co., Baltimore
 Scullin Steel Co., St. Louis
 Edward L. Soule Co., San Francisco
 Baltimore & Ohio Railroad Co.
 Municipal Architect, A. L. Harris, Washington
 Lemuel Norris, Structural Engineer, Washington (Municipal architect's office)
 John W. Oehmann, Inspector of Buildings, Washington
 Oliver Iron & Steel Corporation, Pittsburgh
 Pittsburgh Crucible Steel Co., Pittsburgh
 Donner Steel Co., Inc., Buffalo
 Dietrich Brothers, Baltimore
 Carlem Engineering Co., Philadelphia
 Ole K. Olsen, New Orleans
 Edward A. Tucker Co., Boston
 Penn Metal Co., Boston
 Capitol Steel & Iron Co., Oklahoma City, Okla.
 Alamo Iron Works, San Antonio, Tex.
 Peden Iron & Steel Co., Houston, Tex.
 Building Products Co., Toledo, Ohio
 Rail Steel Products Association
 National Hardware Association
 Southern Hardware Jobbers Association
 National Retail Hardware Association

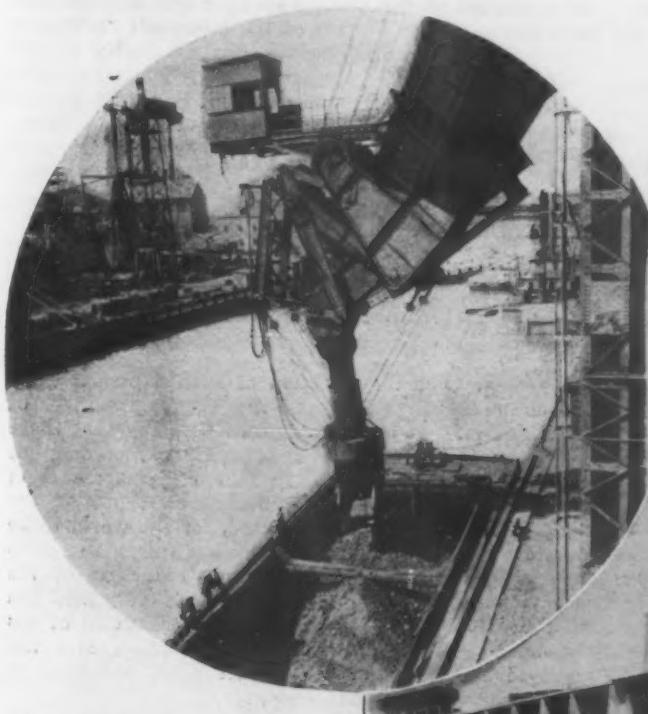
Car Dumper of Unusual Size and Capacity

Designed for Cars Carrying 120 Net Tons of
Coal—Three Men Handle Operation
by Electric and Steam Power

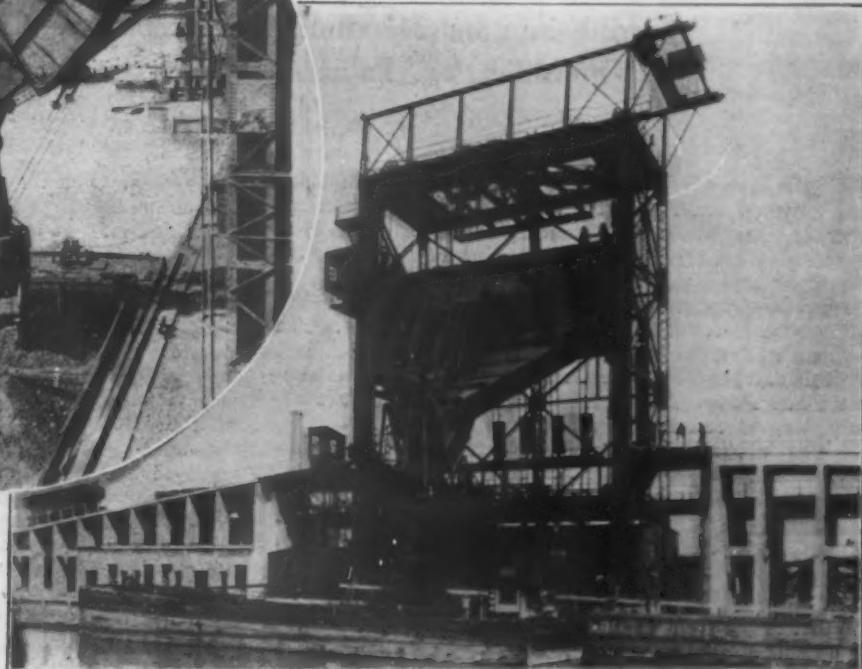
OF the largest capacity ever built for handling single cars, a car dumper having some new features in design was erected recently by the McMyler Interstate Co., Cleveland, for the Reading Railway Co., on the Philadelphia and Reading wharves at Philadelphia. This dumper, which will be used for handling coal from cars to boats, has a capacity for handling a car loaded with 120 net tons of coal. Its maximum lift, including 90,000 lb. for the car, is 330,000 lb. The capacity of the largest coal cars yet built

engine house beneath the dumper. The "mule" runs in a pit at the side of the approach track. At its front is a disappearing arm that is operated by friction on the wheels of the "mule." This arm drops when the "mule" backs down and is automatically raised and acts as pusher against the car of coal when the "mule" is started forward.

Operation of the haulage equipment is so timed that, when one car has been dumped and lowered to the track at the bottom of the dumper, the next loaded



In Circle Is a Close-Up View of the Outer End of the Pan, the Telescopic Chute and the Operator's Cab



for the company is 100 tons, but a dumper of greater capacity has been provided with the expectation that coal cars of 120-ton capacity soon will be built.

The capacity of the dumper is 40 cars per hour, or 4000 tons per hour, when handling 100-ton cars and lifting them to the highest dumping position in the machine. It will handle cars from 8 ft. 6 in. to 11 ft. wide and from 6 ft. 6 in. to 11 ft. in height. The dumper has a minimum lift of 7 ft. 3 in. and a maximum lift of 32 ft. 1 in.

It is much higher than most car dumpers previously built, their usual height being about 90 ft. The main frame is 109 ft. 4 in. in height and above this is a crane runway 16 ft. 1 in. in height to the crane runway rail, on which is mounted a 5-ton service crane, making the total height 125 ft. 5 in. to top of rail. The distance from center to center of the front posts is 72 ft.

Combined electric and steam power operate the machine. The approach and discharge tracks connected with the dumper are on concrete trestles having a 12 per cent grade. Loaded cars are pushed onto the dumper by a "mule" propelled by ropes connected to the drums of the steam engine located in the main

car has reached the top of the approach track and pushes the empty car off the dumper. The empty car passes down the discharge track and the momentum it attains carries it up an incline that is sufficient to cause the car to start backward after coming to a stop. On the down grade an automatic switch turns the car onto a return track which extends through the back of the dumper, the car passing over this track and back into the yard. By having the return track extend through the dumper, space is saved and the pier, which is located out in the water, is narrower than would be required were the return track to run around the dumper. As the return track is at an elevation considerably above the top of the pier, space is conserved at the lower level.

Handling the Loaded Car

The loaded car runs into a cradle of standard type in which it is elevated. The machine has six counterweights, two for the cradle and four for the clamps, the former weighing approximately 83,000 lb. each and the latter 15,000 lb. each. All the counterweights help to balance the cradle and the clamp counterweights

hold the car in place when it is being turned over in the cradle. A special feature is that V-shaped castings are attached to the bottom side of the cradle and to the castings on the supporting frame of the cradle, the function of which is to line up the cradle with the approach track after each dumping operation.

As the car is rotated 160 deg., all the coal is dumped by turning it once. The coal passes from the car to a pan extending from the front of the dumper. This pan is raised and lowered perpendicularly by electrically operated apron screws and the outer end of the pan is raised and lowered by means of a series of ropes connected to an electrically operated hoisting engine in the main engine house. A special feature of the machine is the method of handling the fuel from the pan. At the outer or discharge end of the pan the coal passes into a sliding chute and then to a telescopic chute. The latter can be moved in and out by an electrically operated rope reeved mechanism. The distance from the center of the front posts of the machine to the center line of the telescopic chute is 35 ft., but by moving the chute out, this distance may be increased to 46 ft. 6 in.

From the telescopic chute the coal can be dumped directly into a boat or to a McMyler high-speed belt trimmer which distributes the fuel over the different

decks without hand labor. The trimmer is operated by a 35-hp. motor and has mechanism for rotating the trimmer and for elevating the trimmer belt, each operated by a 10-hp. motor.

Operation by Three Men

The dumper is operated from the main operating house, located at the side of the frame, 80 ft. above the foundation. One man in this house controls the haulage of the cars to the machine. Another operator handles the controlling mechanism for hoisting and dumping and also controls the elevation and lowering of the pan and raises and lowers the outer end of the pan. The cradle and car are hoisted by means of a series of ropes connected to two drums on the hoisting engine and running through a series of sheaves on top of the machine and in the cradle.

At the top of the pan is located an electrically driven chute engine which operates the sliding and telescopic chutes. The chute operator's house is located at the outer end of the pan. He controls the operation of the telescopic chute and also can raise and lower the pan or its apron screws, as well as lift and lower the outer end of the pan. This operator also controls the trimmer at the bottom of the telescopic chute.

Fundamentalism in Ferrous Metallurgy*

Equilibrium and Metallurgical Phenomena—Its Effect on Solidification, Fabrication and Heat Treatment

BY DR. B. D. SAKLATWALLA

THE average human mind displays a tendency toward veneration of the complex and unwittingly ties up the advancement and progress of a science or art with the degree of its complexity. On the contrary complexity may be indicative of lack of progress, especially of the lack of clear understanding of the basic fundamentals, of the art or science. The science of ferrous metallurgy seems to be more or less in this category. No less an authority than Dr. Rosenhain has stated that in ferrous metallurgy we are attempting to run before we have learned to crawl.

The progress of that complex of existing conditions, which we term modern civilization, has proved itself to depend more and more on the progress of metallurgy and especially on that of ferrous metallurgy. This has brought to our attention the importance of visualizing metallurgy from a broad scientific viewpoint and the necessity of establishing its procedure on a systematic basis comparable to other branches of engineering.

The suggestion has often been made that the metallurgist should view his subject from the standpoint of the natural philosopher rather than the specialized technician. The merit of this suggestion is apparent when we consider all the various sciences that find a common meeting ground in metallurgy. Not only the older sciences of chemistry, physics, and mechanics enter into its field but the newer forms of physical sciences, such as "ultra-microscopy" and "atomistics," play an important part in the understanding of the phenomena of metals. Nay, the metallurgist can with profit extend his experience to a wider field than that of the physical sciences by even entering the field of metaphysics. In other words, by surveying the laws governing the existing nature around him and drawing his corollaries therefrom. Nature is no better understandable than from nature.

Principle of Equilibrium

We can follow our reasoning along this line with more clarity if we select as an example some universal principle and survey its application to metallurgical

phenomena. For the selection of such a principle we can do no better than take the great principle of "Equilibrium." It is no exaggeration to say that there is no phenomenon, physical or otherwise, which does not follow this great concept. In fact a digression from it is inconceivable, as the different elements of the world should condition one another, for the world to be a unity. Such conditioning cannot but follow the principle of equilibrium. The constant reduction of his observations to this principle will undoubtedly help the metallurgist to arrive at a clarified explanation of his phenomena. This principle should furnish him the keystone of his scientific structure as it has done in other branches of human endeavor.

We all realize the importance of equilibrium, or balance or harmony, as we may term it, not only in the sciences and in engineering but also in the arts and metaphysics. The works of the great masters could not have been produced without homage to this principle, applying it to composition, color, etc. The metaphysics of human relations undoubtedly is founded on equilibrium and it would not be an undue claim to class the golden rule, "Do unto others as you would that they should do unto you," as an admonition to remember the tenet of equilibrium. We, as chemists, can perhaps discern in this great rule the principles of our reversible equation, mass action and phase rule. If you do not want the reaction to reverse, keep the concentration of your deeds constant.

The importance of the doctrine of equilibrium from a metaphysical standpoint seems to have been recognized early in human history. The Chinese author Chung Yung in his "Doctrine of Equilibrium and Harmony" states the following:

When anger, sorrow, joy, pleasure are in being but are not manifested, the mind may be said to be in a state of equilibrium; when the feelings are stirred and cooperate in due degree, the mind may be said to be in a state of harmony. Equilibrium is the great principle.

An elaboration of the principle of equilibrium as applied to mathematics and physics would be perfectly redundant. Lewis and Randall in their "Thermodynamics" under the heading of equilibrium state, "In

*From an address delivered at the December meeting of the American section of the Society of Chemical Industry, when the author received the Grasselli medal.

all thermo-dynamics there is no concept more fundamental than this."

Can the metallurgist then lightly treat a factor as fundamental as this, much less ignore it? On the other hand, by fundamentally deducing his phenomena to this great principle he can inject greater clarity into his technique and enhance his progress considerably. It is no doubt in a great measure true that the metallurgist has studied the chemical equilibria of his furnace reactions and has applied the principles of physical chemistry to his slag reactions. However, in the case of steel metallurgy, this has been only a very small part of his art. The attainment of right chemistry in the ladle has merely furnished him the basis for the further application of metallurgical science.

Equilibrium and Solidification of Steel

The function of the engineer is to control the progress of natural reactions constituting his process by controlling the conditions influencing such reactions. We may then say that rather meager engineering is applied to the phenomenon of solidification of steel. During this procedure the inherent and prime qualities of the steel, which the speaker in some of his previous publications has termed "pre-natal" qualities, are established and their influence persists through all later working of the metal. It is during this stage that the condition of harmfulness or innocuousness of the non-metallic constituents, absorbed gases, etc., is established. During the solidification, segregation of the various elements and their combination to definite chemical compounds or otherwise take place.

These are all phenomena subject to the law of equilibrium, both chemical and physical. It is true that the phenomena are studied from a thermo-dynamic standpoint, and as a result we have the iron-carbon equilibrium diagram of Rozeboom. However, we have not made any engineering progress and applied this knowledge toward attainment of control over the equilibrium factors, which establish the inherent qualities of steel. As such factors may be mentioned size and distribution of crystals, dispersion or coagulation of non-metallics, elimination of gases, etc.

As a suggestion, the speaker some time ago advised as a trial, the expediency of allowing a steel ingot to solidify under the influence of a controllable electrostatic or electromagnetic field, for the purpose of controlling all these factors. If the equilibrium conditions during solidification could be controlled to eliminate, at least to some extent, the so-called "cast structure," it would simplify the subsequent manufacturing operations and also improve the engineering qualities of the finished product considerably.

The steel metallurgist has undoubtedly manifested some realization of the equilibrium conditions in a solidifying ingot, but only from the standpoint of its thermal equilibrium or rate of cooling. However, the results achieved, while of importance from an economic standpoint, can hardly justifiably be called a control over the grain structure or quality of the material. The general ingot structure, outside of segregation of shrinkage cavities and blow-holes, is not appreciably altered by different mold practices.

Effect of Equilibrium on Fabrication

In the subsequent fabrication of the solidified ingot to rolled or forged products the equilibrium conditions and their control are of even greater importance. The constituents of steel, namely iron and iron carbide, enter into physical interaction at temperatures considerably below the melting point of the constituents and reach a state of equilibrium depending on the conditions of temperature, time, external physical deformation, etc.

Since we are concerned with the ultimate engineering properties of the finished steel, and as such properties are determined by the equilibrium established between the grains of the steel constituents, we can readily see the paramount importance of the most exact study of such equilibrium. The engineering properties are established by such factors as grain size, physical nature of the pearlitic constituent, state of deformation or strain of the grains, and these factors

are nothing else but results of stable or metastable condition of equilibrium, and are produced by transformation of one form of equilibrium to another.

The same reasoning applies, even in a greater degree, to the phenomena of heat treatment of the finished steel. The achievement of remarkably different properties by heat treatment is brought about by changes in the equilibrated free energy conditions of the grains. Their surface energy content is altered by application of external energy and a new equilibrium is established. On this principle are based such phenomena as grain refinement, dispersion and solution of carbides, spheroidizing, etc.

The equilibrium changes are not restricted to microscopic grains only, but refer also to the ultra-microscopic regions. An example of the latter may be mentioned the formation of solid solution by substitution or addition of a foreign atom in the iron space lattice through the application of extraneous energy. Diffusion phenomena may be of this class.

Heat Treatment and Energy Equilibria

The very nature of the procedure of heat treatment operations, such as annealing, quenching, drawing, etc., suggests that they are based on energy equilibria and that the physical conditions are obtained by fixing or holding a certain equilibrium condition, in order to make it persist at the ordinary temperature at which the steel is to perform its particular useful function. It would, therefore, have been more rational and scientific to have based the nomenclature of the constituents produced by heat treatment in steel on the condition of equilibrium established rather than on an empirical basis, such as their tendency of behavior toward etching agents, as at present.

(To be concluded)

Steel Corporation's Unfilled Orders Increase

Unfilled business on the books of the United States Steel Corporation as of Nov. 30 aggregated 4,031,969 tons, or 506,699 tons more than remained unfilled Oct. 31, and the largest amount recorded since April 30. In October the unfilled tonnage increased 51,490 tons, in September 184,203 tons, and in August 102,505 tons, while in July it decreased 75,433 tons, in June 365,584 tons, in May 580,358 tons, in April 574,360 tons, and in March 130,094 tons. In February there was an increase of 114,472 tons in the unfilled business and in January 353,090 tons. A year ago the unfilled business was 4,368,584 tons, or 336,615 tons more than on Nov. 30, this year. Following is the unfilled tonnage as reported by months beginning with January, 1922:

	1924	1923	1922
Jan. 31.....	4,798,429	6,910,776	4,241,678
Feb. 29.....	4,912,901	7,283,989	4,141,069
March 31.....	4,782,807	7,402,332	4,494,148
April 30.....	4,208,447	7,288,509	5,096,913
May 31.....	3,628,089	6,981,351	5,254,228
June 30.....	3,262,505	6,386,261	5,625,531
July 31.....	3,187,072	5,910,763	5,776,161
Aug. 31.....	3,239,577	5,414,663	5,950,105
Sept. 30.....	3,473,780	5,035,750	6,691,607
Oct. 31.....	3,525,270	4,672,825	6,902,287
Nov. 30.....	4,031,969	4,368,584	6,840,242
Dec. 31.....	.....	4,445,339	6,745,703

New Industrial Structures in San Francisco

During 18 months ended July 31 last, 375 new industrial structures were built in San Francisco, according to a survey that has just been made public by the San Francisco Real Estate Board. During the first 10 months of 1924 there were 1000 new industries established in San Francisco, representing a new paid-in capital of \$7,596,400. The annual payroll of these new factories is \$6,742,918.

Within the confines of San Francisco there are now 4218 industries, producing goods of every description, the value of which is estimated at more than \$500,000,000. These industries employ 66,304 persons, with an annual payroll of \$82,265,330.

CHAIRMAN VAN FLEET DISSENTS

Members of Federal Trade Commission Disagree as to Intent of Clayton Act

WASHINGTON, Dec. 16.—Decided differences of opinion continue within the ranks of the Federal Trade Commission. The latest difference made public relates to an opinion by Chairman Vernon W. Van Fleet, who wrote an extremely interesting dissenting memorandum in connection with the complaint announced last Friday against the Fisk Rubber Co., Chicopee Falls, Mass. This dissent follows upon the heels of the individual report recently addressed to Congress by Commissioner N. B. Gaskill, and it is observed with some interest that Mr. Gaskill did not sit in the conference, out of which grew the complaint of the Fisk Rubber Co. The dissent of Chairman Van Fleet hinges upon the interpretation of the phrase "substantially lessen" in the Clayton act inasmuch as the complaint alleges that the Fisk Rubber Co. acquired 51 per cent of the stock or share capital of the Federal Rubber Co., Cudahy, Wis., and that the effect is to "substantially lessen" competition in the sale and distribution of automobile tires, etc. The majority members of the commission hold that such acquisition is in violation of Section 7 of the Clayton act.

Intention of Congress

Mr. Van Fleet in effect maintains that the majority merely has placed a grammatical construction upon the act and has not placed upon it the legislative construction intended by Congress. His dissent, following the recent individual report of Mr. Gaskill, has given rise to the belief that the procedure of the commission not only will have to be revised in order to expedite work but that the commission will either have to be more liberal as to interpretation of the acts under which it operates or the courts will be called upon to construe them for the benefit of the commission as well as the business interests of the country generally.

In his dissenting memorandum in the Fisk Rubber case, Chairman Van Fleet declares that there appears to be no tendency toward monopoly on the part of the Fisk Rubber Co., nor any suppression of competition by it save such as was effected in the acquisition of

the Federal Rubber Co. He explains that it is not even alleged or claimed that its acquisition affected competition in the trade generally or in any locality specifically, a point which is of vital importance not only in this individual case but to all cases that come under Section 7 of the Clayton act. Mr. Van Fleet points out that the case rests solely in the alleged violation of this section and upon the allegation that in the acquisition of the stock, competition between the companies was substantially lessened.

The chairman declares that the theory of the case as maintained by the majority of the commission is that the amount of competition is not material. He explains that the majority's contention is that if there was some competition the amalgamation of the companies substantially lessened it because, of course, it entirely eliminated it.

Dissented in Bethlehem Case

It was Chairman Van Fleet who dissented when the commission issued a complaint against the proposed merger of the Bethlehem Steel Corporation, Midvale Steel & Ordnance Co., and the Republic Iron & Steel Co., in which Mr. Van Fleet pointed out that in view of the large output of the United States Steel Corporation it would be "straining at a gnat and swallowing a camel" to issue a complaint against the proposed consolidation which would represent a much smaller tonnage. He has taken the same course in the present case and has set forth a list of rubber companies which are much heavier producers than the Fisk Rubber Co. He also quotes the decision of the United States Court of Appeals in connection with the dissolution suit against the United States Steel Corporation in which the court plainly recognized that there were no monopolistic or unfair practices alleged against the corporation since the stock was acquired and that whatever there was of wrong intent was discontinued before the suit was brought and this determined the decree.

In the Steel case, Mr. Van Fleet points out, the Steel Corporation had nowise offended by any oppressive or monopolistic practices. The Fisk case is held to be parallel to the Steel Corporation case. To rend the consolidation asunder, he points out, will probably seriously impair the security but may have far reaching and disastrous consequences to the respondent.

New England Foundrymen's Association Inspects Castings

The December meeting of the New England Foundrymen's Association, held Wednesday, Dec. 10, at the Exchange Club, Boston, was along the same lines as the November meeting. Castings of a valve chest were submitted by the Mechanics Iron Foundry, Roxbury, Boston; Estabrook Foundry and Lumsden & Van Stone Co., South Boston; Colvin Foundry, Brown & Sharpe Mfg. Co., and Builders Iron Foundry, Providence, R. I.; and Davis Foundry, Lawrence, Mass. The castings previously were submitted to the Worthington Steam Pump Corporation, Blake & Knowles Works, East Cambridge, Mass., for examination and test.

Charles A. McCarthy, assistant superintendent at the Worthington foundry, took charge of the association meeting and pointed out defects in and merits of the castings submitted. Representatives of the foundries presenting castings explained methods employed in making, and gave an analysis of metals used. Questions were asked from the floor, which dealt with practical foundry molding problems. Mr. McCarthy then explained the foundry practice at his plant in making these castings for the Pennsylvania Railroad, and gave an outline of machining and annealing operations necessary. He was assisted by plant department superintendents, who emphasized the technical issues.

Herman Honald, foundry superintendent Blake & Knowles Works, exhibited a prize awarded him by the American Foundrymen's Association, at the Milwaukee convention, for developing a most practical labor saving mold making contrivance.

Norman Russell, president of the association, presided at the meeting. He appointed George P. Aborn, Worthington Pump & Machinery Corporation, Cam-

bridge; E. H. Ballard, General Electric Co., Everett, Mass., and Robert C. Bird, Broadway Iron Foundry, East Cambridge, a nominating committee for officers to be balloted for at the annual meeting next month. He also appointed Charles A. Reed, Fears & Miller, Inc., Boston; Fred F. Stockwell, Barbour, Stockwell Co., East Cambridge, and H. S. Chaffee, Builders Iron Foundry, Providence, an entertainment committee for the annual meeting. Prof. G. W. Dyer, department of social science, Vanderbilt University, Nashville, is to speak on correct fundamentals of economics and Americanism at the January meeting.

The association's February meeting will be given over to better foundry management and to group insurance, with a talk on better foundry practice. The March meeting, if present plans carry, will be devoted to brass molding problems. Approximately 100 attended the December meeting, with liberal representation of Providence foundries.

Brussels Commercial Fair in 1925

The sixth official Brussels commercial fair, an annual international business exposition, which has become one of the most important fairs of Europe since the war, will be held from March 25 to April 8, 1925, in the gardens and halls of the Cinquantenaire, at Brussels, Belgium. The fair is organized by the city of Brussels and the Belgian Government. At the fair in April of this year there were 2776 exhibitors, 916 of them foreigners from 24 different countries. Particulars about the regulations of the fair, insurance, advertising, form of application for space, etc., can be obtained by addressing the executive committee, 19, Grand Place, Brussels, or the Belgian Consulate, 25 Madison Avenue, New York.

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Commodity prices rising. Government statistics show advance in wholesale prices of every one of the nine major commodity groups.—Page 1598.

Is it financially safe for a company to permit its wage-earners to vote on questions of shop management?—Page 1618.

Knife manufacturers charged with conspiracy to fix prices and suppress competition.—Page 1610.

Freight traffic sets new high record in October. Total net ton-miles over 43 millions, 1 per cent above previous record.—Page 1598.

Argentina worth looking into as a market for industrial equipment.—Page 1609.

Even with loss of Alsace-Lorraine, German iron and steel capacity exceeds French. Government official reports.—Page 1608.

Are high production methods responsible for great loss from defective castings? Heat-treatment of castings before they cool would reduce 32 million dollar scrap bill.—Page 1607.

Four billion dollars spent in building construction in 36 eastern States so far this year; 13 per cent above same period of 1923.—Page 1603.

Abolition of Federal Trade Commission would be "a calamity to decent American business," says Paint Association secretary. But Grain Dealers' Association favors disbandment of commission.—Page 1599.

Improve the steel by controlling equilibrium conditions during solidification of the ingot, says Dr. Skłodowska.—Page 1621.

Induction coils may be used to heat bars and rods to welding temperature as they pass through automatic machines.—Page 1617.

Huge car dumper, largest ever built, unloads 100-ton coal cars at rate of 40 per hour.—Page 1619.

Sheet sales set new high record. November sales of Sheet and Tin Plate Association members total 463,000 tons in November.—Page 1612.

Will Matthew Woll succeed Samuel Gompers as Labor Federation head?—Page 1599.

Steel Corporation's unfilled orders up a half million tons. Nov. 30 total 4,031,969 tons.—Page 1621.

Bookings of fabricated steel work in November were the largest in 20 months. The showing of 11 months is a tonnage nearly as large as the 12 of last year, which was a record.—Page 1647.

One dollar per day extra compensation for each day's work during 1924 to be paid American Cast Iron Pipe employees. Bonuses and extra compensation total close to half million dollars.—Page 1628.

Wage increase by independent coke operators points to an advance in coke prices.—Page 1649.

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Steel in the Long Future

SEEING that the old "rule of doubling" in pig iron production decade by decade, discovered long ago by the late Abram S. Hewitt, showed distinct signs of breaking down before the war, and has failed entirely since, there is furnished a suggestion that increases in future decades will be much smaller. As to pig iron, in contrast with steel, it is easy to get the notion that the production of pig iron represents increasing our store of iron, most of which can be reworked through the open-hearth furnace, so that even without making any pig iron at all we could make millions of tons of steel year by year.

While it would have been unwise 15 years ago to count upon an indefinite continuance of the pig iron doubling, it may be just as unwise now to assume that we are not going to have large increases in the long future in the production of pig iron as well as of steel.

No such thing as a "saturation point" can be conceived in iron and steel, so long as there is economical production and consumption and no other material comes to the front. When the expression "saturation point" is used, one naturally thinks of the automobile and the predictions that were made years ago. Superficially it appears that those predictions failed lamentably. It would be more accurate to take it that in essence the saturation point was closely approached, if not left behind, some time ago.

The saturation point ought not to be measured by the number of vehicles, nor even by the proportion per capita. Automobiles have been decreasing in weight and in cost per pound and the maintenance cost has been decreasing. Economically, the saturation point would be reached when the percentage of the national income spent on automobiling ceased to increase. Quite possibly a close study would show that such a point has been passed. Certainly it has been at least closely approached.

Steel is different in that we go in for bigger things—larger bridges, heavier rails and rolling stock, deeper mines and wells, and so on. At

the same time our population increases. It does not increase so rapidly as formerly, in percentage, but it does increase and will continue to increase.

Part of the failure of pig iron to increase recently as it formerly did is due to slower population growth, and pig iron cannot be blamed for that. From the decade ended 1860 to the decade ended 1910 there was a total increase in pig iron production equal to five successive increases of 99.4 per cent, virtually the exact equivalent of a doubling every ten years. From 1850 to 1900 population increased an average of 24 per cent per decade, and from 1860 to 1910 by an average of 27 per cent. One may take a 25 per cent decennial increase in population to have occurred while pig iron production was doubling. From 1910 to 1920 there was only a 15 per cent increase in population, and the present rate is slower still.

The continued increase in efficiency of the automobile as a means of transportation, in reduction in weight, in cost per pound and in cost of upkeep has resulted in an increase, year by year, in the number of automobiles produced, perhaps with no increase, certainly with no corresponding increase, in the percentage of the total income expended in that way.

With iron and steel there are the growth in population and the improvements whereby a given amount of labor puts more tonnage into employment. A large growth is thus plainly in prospect. For a long time iron was drawing labor from other employments. It still may do that, but it can grow without doing so. In future the same percentage of the total work done by the country will mean a fairly rapid increase in tonnage of iron and steel.

SENATOR COUZENS has made the charge that there was a loss of \$20,000,000 to the Government because of excessive allowance by the Internal Revenue Bureau on the Steel Corporation's amortization claims. Manufacturers who have had experience with the Internal Revenue Bureau can testify, many feelingly, that they saw no evidence of a disposition to yield up easily money

once taken by the Government. It is safe to say that the cases in which the Government finally took more than a corporation had included in its return far outnumber those in which the Government made allowance. The presumption is that if the Government, in accordance with its own rulings, granted \$55,000,000 of the Steel Corporation's claim of \$85,000,000, the interests of the public were fully safeguarded. In general the policy of the Government at Washington in respect to the steel industry's war-time construction was less liberal than that of Great Britain. British steel producers were given exemption from excess profits taxes on a large part of their earnings, in view of the expenditures they were making for new capacity. Some of these, in the early period of the war, were as high as 80 per cent of the cost of the additions.

The Career of Samuel Gompers

IN the 41 years of his presidency of the American Federation of Labor, Samuel Gompers had an important influence upon the industrial life of the nation. For one who had so little schooling and whose early opportunities were limited in so many ways, he reached a position that might well be envied by many who were not so handicapped. His career was a stormy one and it is to be said in praise of him that he was a good fighter. No one ever doubted where Gompers stood, but he was often fundamentally wrong in his policies and some of his errors of judgment were grave.

One chance to do a real service to his country which the labor leader failed to take advantage of was at the time of the steel strike in September, 1919. When THE IRON AGE, after an investigation of conditions in Pittsburgh, McKeesport and neighboring industrial cities, discovered evidence connecting at least the leading spirit of the strike agitation, William Z. Foster, with extreme radicalism, the evidence, including the pamphlet "The Syndicalist," was presented to Mr. Gompers and opportunity given him to use his influence to prevent the strike and to save the American Federation of Labor from all connection with it. Mr. Gompers failed to denounce Foster, but worked with him, and the strike went on with disastrous results. Later events must have convinced him of the mistake he had made, for Foster, after the failure of the strike, became the avowed enemy of the American Federation.

Mr. Gompers erred deplorably in showing sympathy for the striking Boston policemen when he permitted the policemen's union to be received into the Federation and announced that the Federation stood squarely behind the strikers, even after they had forfeited their jobs. Again, perhaps yielding to growing pressure in the organization, Mr. Gompers was justly under criticism in the last Presidential campaign when, after years of opposition to the Federation becoming a part of any political party, he did all in his power to have it support the La Follette candidacy. His career was also marred by his frequent resistance to decisions of courts, even those of the Supreme Court of the United States.

There was, however, another side to Samuel

Gompers. While at times cooperating with the radicals, he was generally rated as one of the conservatives of the labor movement, and in spite of all the strikes that took place during the war, he then rendered service of a high order to his country. He was unsparing in attacking bolshevism or any other form of revolutionary propaganda. The late August Belmont said two years ago: "There is one thing about Gompers—although you have heard me sometimes question the fundamentals of his economics—and that is he is a stiff-backed patriot and can be relied upon to the limit to help protect and preserve our institutions. He can be forgiven anything for this."

In this time of general mourning for the passing of the veteran leader, the opinion of Mr. Belmont will find wide acceptance. The present is not, however, the time for a final appraisal of the services of Samuel Gompers. In manifold ways he served well his day. How far the policies of the Federation represent the dominance of his strong personality and how far the creation of a following that will carry on in the same way under new leadership can be determined only by the disclosures of time.

What's the Use of Economic Education?

ECONOMIC fallacies are preached from soap-boxes by agitators by the thousand, while no one preaches economic truth. Books, and reports and articles of economic truth are written—not very many of them, but some; but they go over the heads of the multitude and never hit any mark. So what is the use of them? Thus speak pessimists.

They are correct only in that economic truths are not preached from soap-boxes; nor are they broadcast by radio. It is unnecessary that they should be. The multitude can be educated by a better method. The power of the press remains as great as ever and among a literate people will always be superior to that of the cinema or of radio.

Well, then what is the use? It is this: There is an enormous economic ignorance and heresy among our most intelligent people. This is ascribable partly to selfishness, partly to blindness, partly to mental inertia. Such people read and think (more or less) and are capable of education. It is they who must be educated first. No great inspiration ever rises from the bottom. Rather does it come from the top and trickle down.

As for the great masses of our fellow citizens we have a better opinion of them than is often expressed. Disregarding the hopelessly incompetent, whom we must always expect to be discontented, and the sentimentalists, who will always be swayed by the heart unchecked by the head, we are convinced that our multitude consists mainly of well-meaning, honest people, who are conscious of their own mental ability being inferior to collegiate grade, let us say, and are anxious to be instructed and led. They become the victims of selfish politicians and of agitators with axes to grind, because most of those who ought to be their leaders will not take the trouble to act thus.

It is our observation in industrial affairs with

which we are acquainted that the workmen look up to their bosses, and that should be the state of mind in well-managed enterprises. If they look up to professional labor leaders instead we may be generally suspicious that the management is derelict. The hundreds of thousands who work for the Steel Corporation, for example, have appreciated that Judge Gary and his generals have conducted its business so as to provide a good return for all, and they do not consider professional labor leaders capable of doing any such thing.

The outcome of the last election is confirmatory of our opinion of the soundness of the American multitude. A great leader like Secretary Mellon offsets a thousand politicians, who without brains simply veer with the wind. The Mellon leadership is like that of Alexander Hamilton 135 years ago. By pure logic, in lucid papers that are not even composed in popular style, Secretary Mellon is instructing the American people as to the economic principles of taxation and is leading them away from the socialistic fallacies for which Kitchin, the pacifist, drove the opening wedge. And we are seeing the first effects of such instructive leadership in the revived optimism with which the American people are now viewing their economic prospects. To pessimists who ask, What is the use? this is the answer.

Steel Consumption in Two Years

SEEING that steel production runs considerably less this year than last, the question has been raised whether production has been a fair index of consumption in each of the years. An answer to this question would have much practical importance, as it would have a direct bearing on what we may expect for 1925. An improvement is predicted for next year, but if this year's consumption has been substantially less than last year's, then we can have a substantial improvement over this year without any heavier consumption than there was last year.

The calendar year's steel ingot production, at something over 36,000,000 tons, will be about 17 per cent below that of last year, but comparing production in ten months of each year there is a decrease this year of 20 per cent, in the period up to the election.

Other business indexes do not show such decreases. Freight car loadings in 11 months have been as follows:

1922	39,888,799
1923	46,505,389
1924	45,065,554

In this very important and indicative item there is a decrease from 1923 to 1924 of only 3.1 per cent. In building contracts let in the first nine months of the two years there is an increase from 438 to 462 million square feet, or 5.5 per cent. Comparing ten-month periods there is an increase in fabricated steel awards from 63.4 per cent of fabricating capacity to 67 per cent, or 5.7 per cent.

These citations do not cover everything, but they are representative or typical. Unless there was a great change in the character of activity, and of this there is no evidence, there could not

be any considerable decrease in actual consumption of steel.

It always has been recognized that variations in stocks of steel make a great difference. Besides stocks of steel in mill form in the hands of jobbers and manufacturing consumers there may be stocks in the hands of retailers and small users, such as the country blacksmith, as well as stocks of wares made from steel.

We have much ground for assuming that in 1923 there was an increase in stocks, and from March of this year up to election time a very thorough liquidation. Last year opened before the influence of the 1922 coal strike was entirely dissipated. The curtailment of production during that strike forced stocks to a low point and at the end of the strike the typical buyer expected steel to become so plentiful that prices would decline, hence the opportunity to stock up was just the opportunity he would not embrace. There may have been in 1923 a return to normal stocks. Certainly at election time stocks were abnormally low.

On an assumption that steel production exceeded consumption by 10 per cent in 1923 and consumption exceeded production by 10 per cent in the first ten months of this year, a substantially uniform rate of steel consumption for the two years would be shown. This is certainly a better practical working basis for 1925 prognostications than to assume that steel consumption was materially less in this past year than in 1923.

The combined ingot production of the two years is approximately 40,000,000 tons a year, or 74 per cent of the 54,000,000 tons which is commonly taken as the present actual capacity. A production in 1925 of 44,000,000 tons would then represent a 10 per cent improvement over the pace of the past two years. Without the allowances here suggested it would mean a 20 per cent improvement over 1924 and no improvement over 1923, which would be a distinctly different thing.

A New "Iron Age" Feature

BEGINNING with this issue, THE IRON AGE will contain each week a page of paragraphs giving the gist of its special articles and news. See page 1623.

We know well what the automobile, the radio and the new thirst for amusement have done to the reading hours of the average man. More and more, in the making of these pages, we have aimed to conserve the reader's precious time by achieving brevity without sacrificing clarity.

That present day pressure demands something more, THE IRON AGE has long realized, and we now present, for the man who must read on the run, the news of the week in tabloid form.

Of course, no one can thrive mentally on tabloid news any more than he can thrive physically on highly concentrated food. But who of us in these crowded days has not occasions when he must get the news quickly or not at all?

At such times the orange insert page will serve the reader well. On all occasions it will be useful in directing him to the articles in which he is most interested.

State Steel Conference to Be Held at Delmonte, Cal.

SAN FRANCISCO, CAL., Dec. 16.—A State-wide steel conference will be held Jan. 23 and 24 at Delmonte Hotel, Delmonte, Cal., under the auspices of the California Development Association, Ferry Building, San Francisco, to discuss marketing problems, industrial development in reference to steel consumption and the importation of foreign steel as it affects the local steel industry.

Invitations to producers, distributors and consumers of steel will be issued by the Association. Between 150 and 200 are expected to attend the conference which will be the first of its kind on the Pacific Coast.

Acipco Employees to Receive \$483,000 in Bonuses for 1924

The American Cast Iron Pipe Co., Birmingham, Ala., announces through the December issue of the *Acipco News* that payments of the 1924 bonus for regular service during the year will be made to employees on Saturday, Dec. 20, in accordance with the schedule announced at the beginning of the year:

\$25 for working every day;
\$20 for working every day except one;
\$15 for working every day except two;
\$10 for working every day except three;
\$5 for working every day except four.

There will be paid also on Dec. 20 the cash bonus for continuous employment, which is figured at the rate of \$2 per year of service for every employee in the organization. The board of directors recently took action allowing a week's vacation with pay to the shop organization for 1924. Therefore the Acipco plant will be closed the week of Dec. 22 to 27 inclusive.

It is also announced that extra compensation for the year 1924 will be paid in the same manner and at the same rate as for 1923. This extra compensation will be \$1 per day for each day's work during 1924. It will be paid during 1925 in bi-weekly installments to the wage men and in monthly installments to the salaried men. The maximum to be paid a wage earner under this plan is \$310 and the minimum is \$156. The maximum to be paid a salaried worker is \$300 and the minimum \$156. Extra compensation will be paid only to those who remain in the employ of the company during 1925.

The total amount of extra compensation thus paid will approximate \$425,000 for the year; the cash bonuses for regular and continuous service will approximate \$28,000, and the week's vacation with pay \$30,000, making a total for 1924 of about \$483,000.

CO₂ Indicator for Small Plants

An inexpensive CO₂ indicator known as the Apex and intended for use in the smaller steam power and heating plants, has been brought out recently by the Uehling Instrument Co., Paterson, N. J. It is claimed that the instrument will operate accurately with a minimum of attention.

The indicator is made up of two principal parts, the actuating device, known as the CO₂ meter, and the gage proper, called the type Z indicator. The flue gas flows through the meter continuously, developing a changing pneumatic pressure within it, the magnitude of the pneumatic changes depending upon the percentage of CO₂ present in the gas. The CO₂ is absorbed in a dry cartridge placed in the meter. The absorption of the CO₂ causes a shrinkage of the gas flowing through the meter and hence a reduction in the pneumatic pressure. Any given percentage of CO₂ in the gas will produce a definite pre-determined pneumatic pressure, which is employed for operating the indicator.

The indicator consists of a manometer containing a glass tube filled with colored liquid, which changes its level according to the pneumatic pressure applied

to it. A scale located beside the indicating manometer is graduated in percentages of CO₂. A simple steam or water aspirator is used to draw the gas from the boiler, through the meter. A large volume of gas is by-passed around the meter at the same time, under the action of the aspirator, which results in quick response to change in furnace conditions. The suction from the aspirator is maintained constant by a hydrostatic regulator, regardless of possible aspirator pulsations.

It is emphasized that at no time is the gas hermetically sealed in the meter, which makes it possible for the indicator to point to the percentage of CO₂ existing in the meter at the moment. Because of the pneumatic principle employed, the instrument is devoid of mechanically operated parts, special glassware and rubber tubing. The indicator is equipped with the Pyro-porus filter, which is placed on the end of the sampling line within the boiler setting and serves to exclude soot and ash. Elimination of sulphuric acid fog from the gas and the complete drying of the gas which prevents corrosion of the sampling line, are other features stressed. A corresponding instrument of the recording type is also available.

Grain Growth in Steel

A paper on "Grain Growth in Steel," by F. S. Dodd, was read at a recent meeting of the Staffordshire Iron and Steel Institute, England, and awarded the research medal of that organization. The author, who explained that he had taken quantitative observations in relation to abnormal grain growth, said in part:

"The materials used were Armco iron and mild steels of varying carbon content. Grain growth was induced by plastic deformation of the samples, followed by annealing. This deformation was brought about on a Brinell machine, using a 10-mm. ball and a load of 3000 kg. applied for one minute. Annealing was conducted at 650 to 700 deg. C.

"The results showed that no abnormal growth occurs with Armco iron, but that under suitable conditions all steels containing up to 0.25 per cent carbon will grow large grains. The stress necessary to produce exaggerated growth increased with the carbon content, and the carbon was responsible for that state of things; the ferrite alone required a definite load at a given temperature. If the temperature of annealing after deformation were too low, no abnormal grain growth took place, but on re-annealing at the proper temperature the steel grew as if it had received no previous annealing. Steel could not be deformed sufficiently to permit grain growth on annealing, however, unless the load exceeded 17 tons per sq. in.

"The treatment to which boiler plates were subjected was very conducive to grain growth, and failure of the plates occasionally resulted. The plates were sheared to size, then the rivet holes were punched, and finally, the plate was bent to shape. All these processes were forms of cold work, and it was only to be expected that some of the grains might grow during riveting if a part of the plate attained the critical temperature for abnormal growth. In preparing the test specimens for micro examination, they were etched, after polishing, with a solution of picric acid in absolute alcohol, to which a little nitric acid had been added. Absolute alcohol proved more efficient than methylated spirit, both as regards rapidity and absence of stains."

The Missoula Stamping Foundry & Machine Works, Missoula, Mont., recently incorporated with capital stock of \$200,000 to manufacture metal specialties and to do general metal stamping tool and die work, has opened negotiations for presses and dies. It will also install a foundry and machine shop for general jobbing business. About Feb. 1 it will be in the market for tool room equipment and for equipment to turn out lids for milk cans. It is estimated that \$35,000 will be spent immediately for equipment, this to be added to later. William E. Baument is president.

Great Britain Awaits Holidays

Railroad Plans Involve Large Outlays—Tin Plate Output Regulation Committee Formed
—German January Developments
Worry Continent
(By Cable)

LONDON, ENGLAND, Dec. 16.

WITH the general position unaltered, the markets are quiet on the approach of the holidays and end of the year. Pig iron makers are faced with heavy costs which they are unable to reduce and increased output at present seems unlikely. There is small home and export demand for foundry grades; moderate sales of hematite have been made.

Iron ore is dull but some works are fully covered through the first half of next year, on recent purchases. Bilbao Rubio is quoted at 22s. 6d. to 23s. (\$5.28 to

Black sheets are dull. There is some Far Eastern inquiry but buyers are not anxious to pay the prices asked. Japanese specifications are unchanged at £19 (3.98c. per lb.) f.o.b.

On the Continent of Europe

Continental demand is quiet, with the markets apprehensive of German developments when the free importation of allied materials ends, in January. The positions of the several works are generally difficult to gage. Some are full up for some weeks. Others are in want of prompt orders.

GERMAN STEEL PRICES HIGHER

Increases of 2 to 13 Per Cent in Past Four Weeks
—Market Very Active
(By Radiogram)

BERLIN, GERMANY, Dec. 15.—Steel ingots now are held at 102 (gold) marks per metric ton, equivalent

British and Continental prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at \$4.70 per £1, as follows:

Durham coke, del'd...	£1	5s.	\$5.87
Bilbao Rubio ore†...	1	4	5.64
Cleveland No. 1 fdy...	4	0	to £4 7s. 20.20 to \$20.43
Cleveland No. 3 fdy...	4	1½	to 4 2 19.14 to 19.26
Cleveland No. 4 fdy...	4	1	19.03
Cleveland No. 4 forge	4	0	18.80
Cleveland basic	4	0	18.80
East Coast mixed...	4	8½	to 4 5 20.78 to 20.90
East Coast hematite...	4	19	to 5 0 22.26 to 23.50
Ferromanganese...	14	0	to 14 15 65.80 to 69.32
*Ferromanganese...	14	0	to 14 15 65.80 to 69.32
Rails, 60 lb. and up...	8	10	to 9 0 39.95 to 42.30
Billets	7	5	to 8 0 34.07 to 37.60
Sheet and tin plate bars, Welsh...	8	7½	39.36
Tin plates, base box...	1	3½	5.52
			C. per Lb.
Ship plates	9	0	to 9 10 1.89 to 1.99
Boiler plates	13	0	to 13 10 2.73 to 2.83
Tees	9	2½	to 9 12½ 1.90 to 2.02
Channels	8	7½	to 8 17½ 1.76 to 1.86
Beams	8	2½	to 8 12½ 1.70 to 1.81
Round bars, ¾ to 3 in.	9	7½	to 9 17½ 1.97 to 2.07
Galv. sheets, 24 gage	17	5	to 17 10 3.56 to 3.67
Black sheets, 24 gage	12	10	to 12 15 2.62 to 2.67
Black sheets, Japanese specifications	15	5	3.20
Steel hoops	10	15	and 12 10* 2.25 and 2.62*
Cold rolled steel strip, 20 gage	16	0	3.36

*Export price.

†Ex-ship, Tees, nominal.

\$5.39) and Bilbao spathic at 18s. to 18s. 3d. (\$4.22 to \$4.28), both c.i.f. Tees.

Finished steel is dull but makers generally are adhering to present prices while consumers are awaiting after-holidays development. The position is more hopeful, owing to recent large programs of the railroads. The London, Midland & Scottish Railway plans now involve £14,000,000 (\$65,700,000) sterling and include 30,000 new wagons (freight cars), 235 locomotives and 2500 passenger coaches.

Pig iron exports in November amounted to 38,018 tons, of which 550 tons was sent to the United States. Total exports of iron and steel of all kinds amounted to 311,630 tons.

Sheets and Tin Plate

The tin plate stabilization scheme is to be continued for a further 12 months from Jan. 15. The price remains unchanged. A committee has been formed to deal with output regulation and possibly the sales organization. The market is dull but a revival is anticipated now that the position is more stable. Further mills have been stopped. Richard Thomas & Co., Ltd., Swansea, has closed its Lydney Works and its Lydbrook Works. Very large stocks are on hand.

Galvanized sheets are quiet but most makers are fairly well placed. Others, anxious for orders, are inclined to accept less money.

Continental Prices, All F. O. B. Channel Ports

Foundry pig iron:(a)			
Belgium	£3 16s.	\$17.86	
France	3 16	17.86	
Luxemburg	3 16	17.86	
Basic pig iron:(a)			
Belgium	3 14	17.39	
France	3 14	17.39	
Luxemburg	3 14	17.39	
Billets:			
Belgium	5 2½ to £5 5s.	24.08 to \$24.67	
France	5 2½ to 5 5	24.08 to 24.67	
Merchant bars:			C. per Lb.
Belgium	5 17½	1.23	
Luxemburg	5 17½	1.23	
France	5 17½	1.23	
Joists (beams):			
Belgium	5 12½	1.18	
Luxemburg	5 12½	1.18	
France	5 12½	1.18	
Angles:			
Belgium	5 17½ to 6 0	1.23 to 1.25	
¼-in. plates:			
Belgium	7 0	1.46	
Germany	7 0	1.46	
½-in. ship plates:			
Luxemburg	7 0	1.46	
Belgium	7 0	1.46	

(a) Nominal.

to \$24.68 per gross ton. Steel bars are priced at 130 marks (1.40c. per lb.). Thin steel sheets are quoted at 220 marks (2.39c. per lb.). The market is much more active and prices are advancing.

Proposed Rates for Scrap Are Held Not Justified

WASHINGTON, Dec. 16.—In a decision announced today the Interstate Commerce Commission held as not justified proposed advances in rates on scrap iron in carloads from Texas, Louisiana and Oklahoma points to St. Louis and other points in defined territories and ordered schedules calling for the higher rates to be canceled. The case passed upon covered other commodities also and related to rates from Southwestern points and according to the railroads was intended to comply with an order removing so-called long and short haul departures. Typical of the proposed advances was the one which would make the present rate of 32.5 per 100 lb. on scrap iron from Dallas to St. Louis 38c.

Capital stock of the Skelton Shovel Co., Inc., Dunkirk, N. Y., has been increased from \$300,000 to \$500,000, the addition to be used in providing for further expansion and for reimbursement for improvements already made or under construction.

Iron and Steel Markets

MILLS AT 80 PER CENT

December Production Shows Further Increase

Pig Iron Up on Coke Wage Advance—More Railroad Buying—Bars Active

At a season in which ordinarily there is a slowing down, steel works operations are still increasing, the average for the country this week being at fully 80 per cent of capacity, with some Pittsburgh and Youngstown producers up to 85 per cent. At the same time Chicago reports continued activity in pig iron and finished steel, while at Pittsburgh there is an increase in specifications for shipment after Jan. 1 and some further additions to the list of active blast furnaces and mills.

Many consumers have specified more liberally, notably in steel bars, than was expected for December, some calling for a large part of their first quarter requirements. Several mills, for the first time in many months, are getting behind in bar deliveries.

The automobile industry, as a rule, is still cautious in ordering, but a maker of car frames and other automobile stampings has just contracted with a Cleveland mill for 50,000 tons of steel, including light plates, strip steel and sheets, for the first half.

In the heavier steel products—bars, plates and shapes—the effort to advance prices continues. In the main the market is stronger, but Pittsburgh mills have been absorbing freight on business in Indiana, and by means of barge shipments Pittsburgh producers have been competing actively in St. Louis and farther Southwest.

Sooner than they expected, merchant pig iron producers are facing higher costs. Independent coke operators in the Connellsville district advanced wages this week to the H. C. Frick Co. scale, and this means that under their contracts, which have a wage advance clause, the furnace companies will pay from 75c. to \$1.15 a ton more for coke in the first quarter of 1925. The immediate result in the Central West is an advance of 50c. a ton in the asking price for pig iron.

Before the higher prices took effect, the appearance in the market of a radiator company, long known as a leader in buying, was taken as the beginning of a buying movement for the second quarter. The company's present inquiry is for 30,000 tons. Pig iron buying has continued at a moderate rate in nearly all centers and the situation is strong.

The Connellsville wage advance restores the rates in effect before the 30 per cent cut of last summer, made at all but Steel Corporation mines and ovens. Recently the corporation, with its increasing coke output, has been getting the call on labor in the Connellsville district.

With 3040 cars bought by the Missouri Pacific, 1000 by the Louisville & Nashville and 800 by the Northern Pacific, and with inquiries for 1000 cars and 2000 car bodies for the Baltimore & Ohio, rail-

road buying continues active. Locomotives were booked to the number of 54.

Makers have advanced railroad spikes 10c. per 100 lb.

Bookings of fabricated steel work in November were the largest in 20 months. The indication is that 1924 will surpass 1923, which made a record, by fully 10 per cent.

The week's awards, which exceed 28,000 tons in the larger projects, put the December rate of bookings thus far at 10 to 15 per cent below the November rate. Conspicuous were business buildings taking 12,000 tons and industrial enterprises (including 4000 tons of oil tank work) amounting to 7000 tons. Over two-thirds of the 38,000 tons of fresh inquiries are for business buildings.

The larger can companies, the American and Continental, have closed or are closing for tin plate for the first half of next year, to a total of about 250,000 tons and the leading producer is now largely sold up for that period, notably at its Western mills.

There is some revival of interest in oil pipe line work. The Pure Oil Co. has ordered at Pittsburgh 60 miles of 8-in. pipe for a Texas line and the Marland Oil Co. is in the market for 75 miles of 8-in. pipe, also for Texas.

Good-sized contracts for 1925 supplies of 50 per cent ferrosilicon have been placed by the large steel companies at \$82.50 per ton, freight to Pittsburgh being absorbed. This is a 10 per cent advance over the 1924 price.

The movement of tin plate to Japan between Dec. 1 and Jan. 10, after which shipments are likely to fall under the restored Japanese tariff going into effect March 10, is likely to reach 350,000 boxes. For shipment from the United States an American oil company is buying 100,000 boxes.

Continental steel markets are apprehensive of developments in Germany after Jan. 10, when free importation of allied materials ends.

The British steel industry, in the low state of shipyard orders, is encouraged by the scale of railroad buying. The London, Midland & Scottish Railway plans to spend £14,000,000.

Pittsburgh

Advance of Wage Scale an Important Factor in a Strong Market

PITTSBURGH, Dec. 16.—Because of its far-reaching effects, restoration of the former wage scale by independent Connellsville coke and coal producers, stands out in the week's developments in this district. These operators, because of the depression of the midyear in iron and steel and severe competition from other producing fields, reduced wages on an average about 30 per cent. The H. C. Frick Coke Co., the Steel Corporation subsidiary, did not go along in this change. Now, with business better and great demands coming out for coke, it has been found necessary to meet the Frick scale, if working organizations are to be maintained.

The change means an increase in coke producing

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Dec. 16, 1924	Dec. 9, 1924	Nov. 18, 1924	Dec. 18, 1923	Sheets, Nails and Wire, Per Lb. to Large Buyers:	Dec. 16, 1924	Dec. 9, 1924	Nov. 18, 1924	Dec. 18, 1923
No. 2X, Philadelphia	\$24.51	\$24.51	\$23.26	\$24.26	Sheets, black, No. 28, P'gh.	3.50	3.50	3.50	3.75
No. 2, Valley Furnace†	21.00	20.50	19.50	22.00	Sheets, black, No. 28, Chicago dist. mill	3.70	3.70	3.60	
No. 2, Southern, C'nt'f	24.05	24.05	22.05	25.05	Sheets, galv., No. 28, P'gh.	4.75	4.75	4.60	4.90
No. 2, Birmingham, Ala.†	20.00	20.00	18.00	21.00	Sheets, galv., No. 28, Chicago dist. mill	4.85	4.85	4.70	
No. 2 foundry, Chicago*	22.50	22.00	21.00	23.00	Sheets, blue, 9 & 10, P'gh.	2.70	2.70	2.70	3.00
Basic, del'd eastern Pa.	23.50	23.00	20.00	23.25	Sheets, blue, 9 & 10, Chicago dist. mill	2.80	2.80	2.80	
Basic, Valley furnace	21.00	20.50	19.00	21.00	Wire nails, Pittsburgh	2.85	2.85	2.75	3.00
Valley Bessemer del. P'gh.	23.70	23.26	22.26	24.76	Wire nails, Chicago dist. mill	2.95	2.95	2.85	
Malleable, Chicago*	22.50	22.00	21.00	23.00	Plain wire, Pittsburgh	2.60	2.60	2.50	2.75
Malleable, Valley	21.00	20.50	19.50	20.00	Plain wire, Chicago dist. mill	2.70	2.70	2.60	
Gray forge, Pittsburgh	22.26	21.76	20.76	23.26	Barbed wire, galv., P'gh.	3.65	3.65	3.45	3.80
L. S. charcoal, Chicago	29.04	29.04	29.04	29.15	Barbed wire, galv., Chicago dist. mill	3.65	3.65	3.55	
Ferromanganese, furnace	105.00	105.00	105.00	109.00	Tin plate, 100 lb. box, P'gh.	\$5.50	\$5.50	\$5.50	\$5.50
Rails, Billets, Etc., Per Gross Ton:									
O.-h. rails, heavy, at mill	\$43.00	\$43.00	\$43.00	\$43.00					
Bass. billets, Pittsburgh	36.00	35.50	35.50	40.00					
O.-h. billets, Pittsburgh	36.00	35.50	35.50	40.00					
O.-h. sheet bars, P'gh.	37.00	37.00	37.00	42.50					
Forging billets, base, P'gh.	42.50	42.50	40.50	45.00					
O.-h. billets, Phila.	41.67	41.67	41.17	45.17					
Wire rods, Pittsburgh	48.00	48.00	45.00	51.00					
Cents	Cents	Cents	Cents	Cents					
Skelp, gr. steel, P'gh, lb.	2.00	2.00	1.90	2.35					
Light rails at mill	1.80	1.80	1.80	2.25					
Finished Iron and Steel,									
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents					
Iron bars, Philadelphia	2.32	2.32	2.32	2.62					
Iron bars, Chicago	2.00	2.00	2.10	2.40					
Steel bars, Pittsburgh	2.10	2.10	2.00	2.40					
Steel bars, Chicago	2.10	2.10	2.10	2.50					
Steel bars, New York	2.44	2.44	2.34	2.74					
Tank plates, Pittsburgh	1.90	1.90	1.80	2.50					
Tank plates, Chicago	2.20	2.20	2.20	2.60					
Tank plates, New York	2.24	2.24	2.14	2.74					
Beams, Pittsburgh	2.10	2.10	2.00	2.50					
Beams, Chicago	2.20	2.20	2.20	2.60					
Beams, New York	2.34	2.34	2.24	2.74					
Steel hoops, Pittsburgh	2.50	2.50	2.50	3.00					
*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.									
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.									

The prices in the above table are for domestic delivery and do not necessarily apply to export business.

THE IRON AGE Composite Prices

Dec. 16, 1924, Finished Steel, 2.531c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 88 per cent of the United States output of finished steel.

Dec. 9, 1924, 2.531c.
 Nov. 18, 1924, 2.478c.
 Dec. 18, 1923, 2.765c.
 10-year pre-war average, 1.689c.

Dec. 16, 1924, Pig Iron, \$21.67 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham.

Dec. 9, 1924, \$21.34
 Nov. 18, 1924, 19.88
 Dec. 18, 1923, 21.88
 10-year pre-war average, 15.72

1924 to Date	High	Low	1923
	2.789c, Jan. 15.....	2.460c, Oct. 14.....	High 2.824c, April 24.....
	\$22.58, Feb. 26.....	\$19.21, Nov. 3.....	Low 2.446c, Jan. 2.....
			\$30.86, March 20.....
			\$20.77, Nov. 20.....

costs of from 75c. to \$1.15, and this is being passed on to pig iron producers, whose contracts for the first quarter of next year provided for just such an exigency. Pig iron producers in turn are adding the higher coke costs to their iron prices, which show an advance of 50c. a ton at least while some makers have added a full dollar a ton to their prices. A similar move may be expected in other districts where the furnaces run on Connellsville coke.

The scrap market will probably be strengthened further by the rising tendency in pig iron which many believe will form the basis of further advances in steel prices.

In the steel market there has been a further loosening up of specifications against orders for shipment after Jan. 1, and also a further boost in the operations

of furnaces and mills. The Carnegie Steel Co., although scheduled for an 83 per cent operation of steel works units, because of the recent flood of specifications, will probably produce nearer 90 per cent of capacity. The Homestead Works of this company is running full, and some of its other local plants are not far behind. Three additional blast furnaces have been ordered on. The Jones & Laughlin Steel Corporation is warming up its eleventh blast furnace and is producing ingots at almost full practical capacity. The Youngstown Sheet & Tube Co. is also producing at full ingot capacity. This and nearby districts are producing steel on an average of about 85 per cent of capacity. That compares with 80 per cent a week ago and a little more than 60 per cent at the beginning of November.

Several makers of steel bars are getting behind in

their orders and the prompt deliveries of a month ago are no longer possible in the other heavy tonnage products. Where there was some stocking during the dull period, such as in wire products and pipe, quick shipments still are possible. The larger can companies have placed their tin plate requirements for the first half of the next year and the leading producer now is largely obligated for that period, notably in its Western district mills.

Strangely enough, the activity is not as yet boosting prices. Several of the independent plate makers no longer are interested even in large tonnages at less than 2c. base, but the 1.90c. price has not disappeared.

Coal and coke prices are not yet very well defined, because there has not yet been time for a practical demonstration of what the change in wage scales will mean in costs, but the common asking price here today on furnace coke was \$4.50, this matching the contract price plus the expected increase in costs. No sales are noted that high, but spot tonnages are scarce because of extra shipments against contracts to safeguard consumers against the holiday interruption to mine and oven operation.

Pig Iron.—The raising of wages by independent Connellsville coke producers has caused a good deal of an upheaval in pig iron, for it means higher costs to the merchant producers and there has been a very general advance in prices. Foundry iron now is not available at less than \$21 Valley furnace, for the base grade, while the more common minimum asking price is \$22 and at least one producer, who has been quoting \$22, has gone to \$23. Basic iron prices below \$21, Valley furnace, have disappeared and even that price does not now appeal to producers. Similarly the price of Bessemer iron has been advanced to \$22 and on malleable grade the minimum quotation now is \$21. There are no sales upon which to base these prices, because so many melters covered their first quarter requirements last month, but producers without exception believe they should not be called upon to bear the increased costs imposed by the higher coke prices and are not disposed to take additional business except at prices that compensate for this increase. Low phosphorus pig iron now is quoted at \$29, Valley furnace. The Carnegie Steel Co. has ordered on furnaces at its Edgar Thomson Works, and Mingo, Ohio, while the third resumption will be either at New Castle, Pa., or Bellaire, Ohio. These additions will give that company 41 out of 58 furnaces active. With additions to the Jones & Laughlin stacks and those of the Bethlehem Steel Co. at Johnstown, Pa., the end of the week will see 94 furnaces in this and nearby districts in production; that compares with 76 at the beginning of November.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being \$1.76 per gross ton:

Basic	\$21.00 to \$21.50
Bessemer	22.00 to 22.50
Gray forge	20.50 to 21.50
No. 2 foundry	21.00 to 22.00
No. 3 foundry	20.50 to 21.50
Malleable	21.00 to 22.00
Low phosphorus, copper free	29.00

Ferroalloys.—Prices are firm at recent levels. Reports persist that higher prices are immediately ahead in ferromanganese, and this notion is strengthened by the action of British producers in ordering agents yesterday to close business which had been quoted against. Quotations then were withdrawn. British material is expected to go to \$107.50, c.i.f. Atlantic seaboard, duty paid, late this week, and agents of domestic producers are looking for higher prices daily. Makers of 50 per cent ferrosilicon are very firm at \$82.50, delivered, for 1925 contracts and one producer now is asking \$80 for tonnages for shipment over the remainder of this year. Leading commercial producers of spiegeleisen are rather well committed against first quarter and first half of 1925 production and naturally are quite firm as to prices. Prices are given on page 1645.

Semi-Finished Steel.—The result of the heavy buying of the past three or four weeks in finished steel products is finding reflection in the market for semi-finished steel. Producers no longer show much anxiety for billet, slab and sheet bars business, because they see no surplus over their own requirements and those of their regular customers for some time and are disposed to take a stronger stand on prices. A careful canvass of makers in this district discloses none willing now to go below \$36 for rolling billets and slabs. More makers than usual are exacting the extra price of \$1.50 a ton on small billets and on sheet bars the quotation of \$37 is more common on contract tonnages than on current new business, on which there are quotations as high as \$38. Sources of supplies of forging billets have narrowed down to a few mills, and the fact that most producers would prefer rolling billets at \$36 to forging quality at \$42.50 strengthens the position of those who remain in the market and are naming the latter figure. The new base on wire rods is beginning to find some basis in sales; we note one good-sized sale of high carbon rods at \$58, Pittsburgh, which includes the size extra of \$2.50 and the carbon extra of \$7.50. Skelp is inactive, but makers are firm at 2c. Prices are given on page 1645.

Wire Products.—Makers in this district have heavy orders for shipment starting during the last few days of the year and around Jan. 1, but the inventory period remains a restrictive factor on shipping instructions for the next two weeks. The new prices are generally quoted and find reasonably close observance, although it is reported that in this immediate district, due to the fact that some producers who have withdrawn from the more distant points on account of heavy freight equalization have surplus tonnage and are waiving freight charges. This branch of the steel industry is now operating at 75 to 80 per cent of capacity, largely against business for shipments after Jan. 1. Prices are given on page 1644.

Rails and Track Supplies.—A further advance of \$2 a ton has been announced in prices of spikes by makers here. New prices are \$2.90, base, per 100 lb. for large spikes and \$3.20, base, for small ones, for carload lots. Makers have fairly heavy first quarter obligations, but the chief factor in this advance is the firmness of the bar market at 2.10c., base. Former prices are said to have been based on 2c. bars. The American Steel & Wire Co. still quotes small spikes at \$3, base, f.o.b. Cleveland, with freight equalized with Pittsburgh. Other track supplies are at recent prices. Light rails still find only a limited sale and efforts to advance prices are not very successful. Local standard rail unit of the Steel Corporation is more fully engaged than before in several weeks, due to the start of rolling on 1925 business. Prices are given on page 1644.

Sheets.—This market is gaining steadily in strength and it is not surprising in view of the way orders piled up in November. Report for that month of the National Association of Sheet and Tin Plate Manufacturers, given in detail elsewhere in this issue, shows bookings of 462,700 tons, a new high record for any one month, this report embracing about 95 per cent of the independent capacity of the country. The American Sheet & Tin Plate Co. has done at least as well as the independent companies. The last month of the year is marked by rising mill operations, instead of the reverse, as is usually the case, and prices are stiffening, with black sheets now the only grade on which there is much shading of the prices recently named by the larger independents and the American Sheet & Tin Plate Co. A strong market for spelter is not without effect on the price ideas of makers of galvanized sheets. The American Sheet & Tin Plate Co. last week operated at almost 82 per cent of capacity and will put on more mills this week as the crews can be secured. Independent mills are even more fully engaged and the industry as a whole is now near an 85 per cent gait. Prices are given on page 1644.

Tin Plate.—Larger can companies have entered their orders for the first half of 1925 and the requirements of the largest one, which will be furnished by

the American Sheet & Tin Plate Co., will amount to about 1,000,000 boxes a month. Western mills of this company now are fully booked for the entire half year; it will be interesting to observe what effect this will have on the Chicago delivered prices of independent producers. It would appear that \$5.50, plus 34c. per 100 lb., would soon become the Chicago price. The leading interest also has taken 180,000 boxes of re-export business for oil cans. This and the container business is entirely an obligation against 1925 production, as unlike the condition a year ago, there has been no production against future requirements. The company last week operated 66 per cent of its tin mills and will put on additional units this week. Independent company operations are also expanding, with two of them, one with 24 mills and the other with 32, having all units running the full 16 turns a week. The price on domestic business still is \$5.50 per base box, Pittsburgh, for standard cokes, subject to the usual preferences to large consumers.

Iron and Steel Bars.—The first of the year is so close at hand that buyers no longer fear heavy deliveries before inventory and there has been a veritable flood of specifications and a further increase in mill schedules. The price is solid at 2.10c. base, Pittsburgh district mills, on all new business, and very prompt deliveries are not promised even at that figure. Increasing demand give firmness to iron bar prices. Prices are given on page 1644.

Structural Material.—Mills in this district are well obligated and are very firm at 2c., base, for large beams on new inquiries. Fabricating capacity here is not fully engaged, but there are not many projects of size in this district. The one exception is three bridges to span the Allegheny River and the county commissioners are being besieged with demands to build one structure at a time instead of two, as it is proposed. About 18,000 tons of steel will be required for the three bridges. Plain material prices are given on page 1644.

Plates.—Several mills are well off in the matter of business and are not interested in new business, even of large proportion, at less than 2c. The leading producer and at least one of the large independent companies still are taking the more attractive orders at 1.90c. Prices are given on page 1644.

Cold-Finished Steel Bars and Shafting.—Makers in this district have accumulated a considerable amount of first quarter business and are getting specifications with some freedom since the end of the year is so close at hand. Not much business has been entered at 2.80c., base, but on the test that price has prevailed. Ground shafting effective Dec. 15 has been advanced \$2 a ton to 3.20c., base, f.o.b. mill, for carload lots.

Hot-Rolled Flats.—Some effort is being made to raise the price of wider material from its present base of 2.25c., but all mills are not yet sold up very heavily, and no sales are noted at more. The market is in a stronger position on the narrower stock, bookings of which have been rather heavy in the past two weeks. Prices are given on page 1644.

Cold-Rolled Strips.—Sales at 4c., base, persist and efforts of some producers to establish the market at 4.15c. have not been successful, although some business has been entered at that figure. It now looks as though 4c. would be the base on much of the steel shipped in January.

Tubular Goods.—Some activity has been created in oil country pipe by the striking of gusher wells in the Wortham, Tex., field, but generally, this class of goods continues to lag behind standard pipe and there are no strong hopes of real activity in oil well goods until that industry has made further progress in the correction of an over-supply situation. Standard pipe orders for shipment after Jan. 1 are liberal, but the inventory period being at hand, it is hard to win from jobbers specifications for shipments between now and the end of the year. There are no suggestions of an immediate change in pipe prices. There is not enough boiler tube business to give all a share and prices still favor buyers. Some interest is observed in line pipe, the Pure Oil Co. having placed 60 miles of 8-in. for a

line in Texas which will be produced by a Pittsburgh maker, while the Marland Oil Co. is in the market for 75 miles of 8-in., also for Texas. Discounts are given on page 1644.

Bolts, Nuts and Rivets.—Restoration of the former practice of selling bolts and nuts at a delivered price seems to be meeting a favorable response and makers here have already booked a number of first quarter contracts. The fear of localization of business is not so great under the present method of selling as it was when there were several basing points. Rivet prices for the first quarter will be the same as those now ruling, makers having indicated a willingness to take business for that delivery at these prices. Prices and discounts are given on page 1644.

Coke and Coal.—The first reaction to the news of the restoration of the Aug. 23, 1922, scale by independent Connellsville coke and coal producers has been a decided stiffening in asking prices on furnace coke and the coking grade of coal. Lately furnace interests which have been going along on spot purchases have found little available at less than \$3.75 per net ton at ovens. It is estimated that the change in the wages means an increase of 75c. to \$1.15 and the minimum amount was added to the ruling price just before the change was made. So we have a price of \$3.75 based on sales and \$4.50 now commonly asked. Contracts for first quarter written at \$3.25 to \$3.50 now are automatically increased by the amount of the increase in wages. Foundry coke has been slower in responding to the change, still being quoted at \$4.50 to \$5 for spot tonnages and from \$5 to \$5.50 on contracts. The coal market is poor except on coking grade. There is much speculation as to the effect of the change in wages in Connellsville upon wages in other non-union fields. It is believed union districts in this part of the country will do better now that the Connellsville district is back on the union scale.

Old Material.—The recent advance in steel works grades is well maintained, although there is a tendency on the part of consumers to test the market before buying. There has been some buying, however, of fair sized tonnages of heavy melting steel for delivery after Jan. 1 in order that it will not show in inventories, at \$21.50 to points where the specification is not severe, while \$22 has been paid by consumers who are exacting as to the grade of material shipped. The market, therefore, remains quotable on this grade at \$21.50 to \$22 on the business of the past week, although it is doubtful whether round tonnages now could be had at less than the higher figure. A contract for about 1000 tons of low phosphorus billet and crop ends for shipment over the first half of next year is reported at \$26.50 and for early delivery \$26 is as low as dealers are willing to go because of the possibility of not being able to cover at a profit. Other open-hearth grades share the strength of heavy melting steel and the general market is helped by the strength of the outside markets and the disinclination of scrap producers to sell. There is a marked scarcity of machine shop turnings and borings also are strong.

We quote for delivery to consumer's mill in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

Per Gross Ton
Heavy melting steel.....\$21.50 to \$22.00
No. 1 cast, cupola size.....19.00 to 19.50
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntingdon, W. Va., and Franklin, Pa. ....20.50 to 21.00
Compressed sheet steel.....19.50 to 20.00
Bundled sheets, sides and ends.....18.50 to 19.00
Railroad knuckles and couplers.....22.50 to 23.00
Railroad coil and leaf springs.....22.50 to 23.00
Low phosphorus blooms and billet ends.....26.00 to 26.50
Low phosphorus plate and other material.....24.50 to 25.00
Railroad malleable.....20.50 to 21.00
Steel car axles.....22.50 to 23.00
Cast iron wheels.....19.50 to 20.00
Rolled steel wheels.....22.50 to 23.00
Machine shop turnings.....17.50 to 18.00
Sheet bar crops.....22.50 to 23.50
Heavy steel axle turnings.....18.50 to 19.00
Short mixed borings and turnings.....15.00 to 15.50
Heavy breakable cast.....18.00 to 18.50
Stove plate.....17.00 to 17.50
Cast iron borings.....17.50 to 18.00
No. 1 railroad wrought.....18.00 to 18.50
No. 2 railroad wrought.....21.50 to 22.00

Chicago

Continued Activity in Pig Iron and Steel— Notable New Projects

CHICAGO, Dec. 16.—Sustained activity in both pig iron and finished steel at a time of the year when buying usually declines indicates the fundamental strength of the market situation. In some lines, notably the lighter finished steel commodities, signs of a preinventory lull are to be noted, but for the most part the buying movement has lost little impetus and is manifesting its lasting qualities through pressure for shipments and through fresh orders for material.

Pig iron is very strong with prices up another half dollar. The American Radiator Co., which has always been a reliable barometer of conditions in the pig iron market, is inquiring for 30,000 tons for the second quarter requirements of its Western plants.

Finished steel prices are firm, but do not appear to be ready for another advance at the moment. Local mills are well booked ahead in plates, shapes and bars, an important independent, in fact, being practically sold through the first quarter, but producers east of here have not yet built up such comfortable backloggs and are reaching into this territory for business. A Pittsburgh district mill has met the ruling local price on bars for Chicago delivery and at St. Louis as well as lower Ohio River points where barge steel may be delivered. Pittsburgh competition has been keen. Whereas Pittsburgh producers could not afford to absorb the freight disadvantage into this territory when Chicago prices were at their lowest, the net return on such business as they take now will compare favorably with ruling prices at Pittsburgh prior to the recent advance in the market.

Railroad equipment buying remains a strong feature of the market, orders from the Missouri Pacific, Northern Pacific and Louisville & Nashville accounting for more than 4800 cars. The Burlington has put out an additional inquiry for 1500 automobile cars and the Baltimore & Ohio has entered the market for 1000 gondola cars and 2000 freight car bodies. The Missouri Pacific has placed 50 locomotives. Arrival of activity in the oil fields has yielded orders for 14,000 tons of tankage. Structural steel building and bridge awards lag, following the unusual activity of the past month, but a number of large fresh projects are coming before the trade. A new warehouse for Hibbard, Spencer, Bartlett & Co., Chicago, will involve 5000 tons of fabricated steel or 1500 tons of reinforcing steel, according to the design followed. Another local prospect is a so-called temple of agriculture to embrace a convention hall with a seating capacity of 20,000, a hotel with 3500 rooms, extensive exhibition floors and a large office building. Tentative plans drawn by Graham, Anderson, Probst & White, Chicago architects, provide for 2,500,000 sq. ft. of floor space. It is hoped to complete the entire structure by May 1, 1927.

Local mill operations continue to expand. A leading interest has blown in one stack each at South Chicago and Joliet, increasing the number of active steel works furnaces to 26 out of a total of 34 in Chicago territory. Its steel output has risen to 82 per cent of ingot capacity, while a leading independent remains on a 90 per cent basis.

Pig Iron.—Local iron has again advanced 50c. a ton to \$22.50 base, furnace, following a week of heavy buying. Two Western buyers have closed for 5000 tons and 1000 tons of basic respectively, while a local user has contracted for 15,000 tons for first quarter shipment. That a second quarter buying movement will soon be under way is now expected in view of an inquiry from the American Radiator Co. for 30,000 tons for that delivery to be distributed between its plants at Bremen, Litchfield, Kansas City, St. Paul, Detroit and Springfield, Ohio. Thus far orders have

been limited principally to first quarter, but the amount of tonnage bought for that period has reached surprising proportions. Buyers from the largest to the smallest have placed repeat orders and requests to anticipate shipments have been so numerous as to embarrass producers. In fact, local furnaces are already short of some grades and their aggregate stocks on hand have dwindled to an inconsequential tonnage. To alleviate this situation, plans call for the early blowing in of additional capacity, a second Federal furnace being scheduled to go in after Christmas and a third Iroquois shortly after Jan. 1. A sale of 1000 tons of low phosphorus brought out a price approximately \$1 higher than that which governed the most recent previous transaction in this district. Charcoal remains active, but prices are unchanged and the Ashland furnace is reported to have blown out. Electric ferrosilicon, 14 to 16 per cent, has advanced to \$42, Niagara Falls, or \$47.42, delivered. Sales of Southern iron have been few, with prices unchanged.

Quotations on Northern foundry, high phosphorus, malleable and basic iron are f.o.b. local furnaces and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards.

Northern No. 2 foundry, sil.	1.75 to 2.25..	\$22.50
Northern No. 1 foundry, sil.	2.25 to 2.75..	23.50
Malleable, not over 2.25 sil.	.....	22.50
Basic .....	.....	22.50
High phosphorus	.....	22.50
Lake Superior charcoal, averaging sil.	.....	29.04
1.50, delivered at Chicago	.....	24.18
Southern No. 2 (barge and rail)	.....	26.01
Southern No. 2, sil. 1.75 to 2.25	.....	33.00
Low phosph., sil. 1 to 2 per cent, copper free	.....	35.29
Silvery, sil. 8 per cent	.....	47.42
Electric ferrosilicon, 14 to 16 per cent	.....	47.42

Ferroalloys.—Fully 2500 tons of ferromanganese for second quarter shipment has been sold at \$105, seaboard, but a number of producers have advanced to \$110, although that quotation is not yet general. Approximately 600 tons of spiegeleisen has been placed at \$32, Eastern furnace, and an advance of \$1 a ton is believed to be imminent. Most Western users have placed their 1925 requirement contracts for 50 per cent and 75 per cent ferrosilicon, and high carbon ferrochrome.

We quote 80 per cent ferromanganese, \$112.56, delivered; 50 per cent ferrosilicon, for 1925 delivery, \$82.50, delivered; spiegeleisen, 18 to 22 per cent, \$40.58, delivered.

Plates.—A revival of activity in the oil fields is the feature of the plate market. Oil storage tank awards on the Pacific Coast and in the Southwest aggregate 4000 tons, all of which will be rolled by local mills. Among these lettings are four 100,000-bbl. tanks for the Pan American Petroleum Co. at Watson, Cal., 1600 tons, which was placed with American Bridge Co., four 55,000-bbl. and two 37,500-bbl. tanks for the same company at Watson, 1300 tons, awarded to the Western Pipe & Foundry Co., and four tanks for the Humble Oil Co. at Wortham, Tex., 1200 tons placed with the Chicago Bridge & Iron Works. An inquiry for 6000 tons of tankage is pending. Railroad equipment buying continues to command attention, the largest order for the week, 4000 cars, having been placed by the Missouri Pacific.

The mill quotation is 2.20c., Chicago. Jobbers quote 3.10c. for plates out of stock.

Sheets.—Mills are steadily adding to their bookings, although demand is not yet on a par with that for bars, plates and shapes. An early advance of \$2 a ton on blue annealed is a possibility.

Chicago delivered prices from mill are 3.75c. for No. 28 black, 2.85c. for No. 10 blue annealed, 4.90c. for No. 28 galvanized. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Jobbers quote f.o.b. Chicago: 3.80c. base for blue annealed, 4.50c. base for black, and 5.50c. base for galvanized.

Bars.—Local mills rolling mild steel bars have generous forward bookings, an independent, in fact, being practically committed through the first quarter. Both specifications and new business have been in good volume and while a tapering off in buying was expected with the approach of the holidays and the inventory period, no such development has yet occurred. Recur-

rent reports of the activities of outside mills in this and adjacent territories would indicate that they have not yet built up backlog comparable with those of Chicago producers. One Pittsburgh district mill is reported to have met the ruling Chicago price in booking 1000 tons of bars for local delivery; other Pittsburgh producers are still absorbing freight to meet Chicago quotations in Indiana, in the St. Louis district and in the Southwest. Their freight disadvantage is being overcome, in part, by barging steel down the Ohio River to Evansville, Ind., St. Louis and other points. Notwithstanding the impetus gained by the steel market during the past month, automobile manufacturers are still conservative in their purchases, limiting their orders to actual immediate requirements. The position of bar iron mills is gradually improving as a result of larger buying and improved specifications. A representative local producer, operating on a single turn basis, now has three to four weeks of work ahead. Prices are unaltered, but with consumers turning more and more to bar iron as deliveries on soft steel become more remote, it is probable that the next change will be upward. Business in rail steel bars is improving steadily with increased tonnage coming from fence post makers and the implement industry. The principal season for the sale of fence posts is in the first quarter of the year. Tonnage from bed manufacturers is below normal, reflecting the curtailed demand for beds during the winter.

Mill prices are: Mild steel bars, 2.10c.; common bar iron, 2c. to 2.10c., Chicago; rail steel, 2c. to 2.10c., Chicago mill.

Jobbers quote 3c. for steel bars out of warehouse. The warehouse quotations on cold-rolled steel bars and shafting are 3.80c. for rounds and 4.30c. for flats, squares and hexagons; 4.15c. for hoops and 3.65c. for bands.

Jobbers quote hard and medium deformed steel bars at 2.60c.

Wire Products.—Specifications are steadily increasing in volume, but the improvement in this respect is gradual rather than spectacular. Jobbers, particularly, are prone to keep down their stocks until inventories have been taken. Much heavier bookings are therefore expected after the first of the year. There appears to be no immediate prospect of another price advance. For mill prices see page 1644.

We quote warehouse prices f.o.b. Chicago: No. 8 black annealed, \$3.15 per 100 lb.; common wire nails, \$3.25 per 100 lb.; cement coated nails, \$2.55 per keg.

Rails and Track Supplies.—Orders for rails and fastenings are not being placed as rapidly as had been anticipated. In fact, none of the large pending rail tonnages has been placed during the week and bookings in track supplies have been light. Miscellaneous lots of rails placed with a local mill aggregate 8000 tons; bookings in spikes total 10,000 kegs, in bolts 8000 kegs, in tie plates 1500 tons. Perhaps the most encouraging feature of the market is the prospect for additional orders for both rails and fastenings from roads which have already bought generously for 1925.

Standard Bessemer and open-hearth rails, \$43; light rails, rolled from billets, 1.90c. to 2c., f.o.b. maker's mill.

Standard railroad spikes, 2.90c. mill; track bolts with square nuts, 3.90c. mill; steel tie plates, 2.35c., f.o.b. mill; angle bars, 2.75c., f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.45c. base, and track bolts, 4.45c. base.

Cast Iron Pipe.—Detroit has awarded 2000 tons of 6- and 16-in. to the National Cast Iron Pipe Co. The same company has the order for 270 tons of 4-, 6- and 8-in. for Jonesboro, Ill. La Grange Park, Ill., has postponed action on 700 tons until Dec. 22. Minneapolis takes bids on 1800 tons of 6- and 12-in. Dec. 18. Menasha, Wis., will receive tenders on 250 tons Jan. 6. The season is rapidly approaching when the larger municipalities place orders for their spring requirements. Quotations are stiffening and are now on the basis of \$40, Birmingham, for 6-in. and larger.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., \$52.20; 6-in. and over, \$48.20; Class A and gas pipe, \$5 extra.

Structural Material.—Fabricating awards for the week total 6200 tons, but oil storage tanks made up nearly two-thirds of the aggregate. Most of the large

pending bridge and building projects were closed under protections granted before the recent advance in plain material, hence the present lull is not surprising. The newest development of interest to the trade is the announcement by Hibbard, Spencer, Bartlett & Co., Chicago, that they will start at once to erect a 14-story hardware warehouse to embrace 1,000,000 sq. ft. of floor space. It is estimated that 5000 tons of structural steel will be required if a fabricated steel design is followed, or 1500 tons of concrete bars if a reinforced concrete building is erected. Plans are expected to be issued shortly.

The mill quotation on plain material is 2.20c., Chicago. Jobbers quote 3.10c. for plain material out of warehouse.

Reinforcing Bars.—The market is increasingly quiet as the year end approaches, although some attractive new prospective work has developed. The city of Chicago will soon place contracts for nine elementary schools, of which two are now out for figures. The city has approved a 10-year program, calling for the construction of 180 school buildings. This week general contract bids will be taken on Sections 11 and 12 of the South Water Street double decking, Chicago, requiring 1000 tons of reinforcing.

Lettings include:

Illinois State road work, 700 tons to Olney J. Dean & Co. Sheboygan County Sanitarium, Sheboygan, Wis., 100 tons to Concrete Steel Co.

Pending work includes:

Elementary public school, Eighty-second and Bishop Streets, Chicago, 200 tons.

Elementary public school, Seventy-eighth Street and Prairie Avenue, Chicago, 200 tons.

Sections 11 and 12 of South Water Street double decking project, Chicago, 1000 tons, general contract bids to be taken this week.

Bolts and Nuts.—Implement and automobile manufacturers, jobbers and others are now contracting for their first quarter needs on the basis of the new discounts. A number of automobile makers are attempting to contract for six months ahead, but so far as can be ascertained bolt makers are unwilling to commit themselves beyond first quarter. Meanwhile specifications against fourth quarter contracts are liberal. The new mill prices which are on the basis of freight allowed to destinations north of the Ohio River, east of the Mississippi and south of a line drawn from Dubuque to Milwaukee, are shown on page 1645.

Jobbers quote structural rivets, 3.50c.; boiler rivets, 3.70c.; machine bolts up to $\frac{1}{2}$ x 4 in., 55 per cent off; larger sizes, 55 off; carriage bolts up to $\frac{1}{2}$ x 4 in., 50 off; larger sizes, 50 off; hot pressed nuts, squared, tapped or blank, \$3.60 off; hot pressed nuts, hexagon, tapped or blank, \$4 off; coach or lag screws, 60 per cent off.

Turnbuckles.—Manufacturers of turnbuckles have issued entirely new list prices and discounts and have followed the plan of bolt and nut makers in allowing freight to destination east of the Mississippi River and north of the Ohio River. Inasmuch as the list prices as well as the discounts have been changed, the advance in quotations is not uniform. The allowance of freight adds another complexity which makes it difficult at this time to estimate the extent of the advances.

Coke.—Shipments to foundries are increasing rapidly and numerous contracts for first half are being closed on the basis of \$10.75, delivered Chicago switching district, for the by-product material.

Old Material.—A leading mill has made additional purchases of heavy melting, aggregating 10,000 to 12,000 tons at \$19 delivered. These orders, coming so close on the heels of purchases of 30,000 tons by the same intercat a week ago, have given added impetus to market activity. In fact, dealers are finding it exceedingly difficult to buy material to fill the orders at less than the sales price and in some instances have been forced to pay more. Consumer buying has also

New York

Higher Pig Iron Prices Probable—Steel Buying Active—Spikes Advanced

NEW YORK, Dec. 16.—The news of the adoption of the Frick scale by the independent coal and coke operators in the Connellsville district is the principal topic of discussion among buyers and sellers of pig iron. It is expected that the higher wage scale will result in an increase of costs of pig iron of about \$1 a ton, and it is probable that higher prices will soon be announced. Whether a sufficient advance to cover the increased cost could be maintained is not certain, but the pig iron market is strong at the present time. Sales last week amounted to about 10,000 tons and inquiries for some 5000 to 6000 tons are pending. Other companies that are in the market are the American Locomotive Co. and the New York Central, each for from 900 to 1000 tons for first quarter delivery, while an unnamed New Jersey company is inquiring for 3000 tons and a Connecticut company is in the market for 1000 tons. The market is firm at \$23, eastern Pennsylvania, and \$22, Buffalo. Foreign iron is receiving more attention and several firms are mentioned as having contracted for small lots of foundry iron to be imported from Europe. A New York company is offering 1200 tons of iron imported from Holland analyzing 3.50 to 4 per cent silicon at \$23.75 per ton, c.i.f. Providence, R. I. Importers are inclined to await a higher domestic market before urging buying by American meltters.

We quote delivered in the New York district as follows having added to furnace price \$2.52 freight from eastern Pennsylvania, \$4.91 from Buffalo and \$5.44 from Virginia:

East. Pa. No. 2, sll. 1.75 to 2.25.....	\$25.52
East. Pa. No. 1X fdy., sll. 2.75 to 3.25....	26.52
East. Pa. No. 2X fdy., sll. 2.25 to 2.75....	26.02
Buffalo, sll. 1.75 to 2.25.....	26.91

No. 2 Virginia, sll. 1.75 to 2.25..... 30.44

Ferroalloys.—The ferromanganese market is decidedly active. Fairly large sales have been made, including 3000 tons of British ferromanganese today, and there are some attractive inquiries before the market. The probability of higher prices in the not distant future is one incentive. Sales have all been made at the full price of \$105, seaboard basis, for delivery during the first half. One seller, however, is quoting \$110 for electric ferromanganese made in Norway for delivery in the second quarter. Business in spiegeleisen continues active and fairly liberal sales have been made in the last week. Quotations have been advanced \$1, to a range of \$32 to \$34 for the higher grade and \$31 to \$33 for the lower. Liberal contracts for 1925 for 50 per cent ferrosilicon are noted with most consumers covered. The contract price has been advanced 10 per cent, to \$82.50 per ton, freight absorbed to Pittsburgh, with a differential of \$1.70 for each 1 per cent above or below the 50 per cent base. For 1925 contracts for ferrochromium the method of quoting has been slightly changed, a flat rate of 11.50c. per lb. of contained chromium delivered, being placed on standard ferrochromium containing 4 per cent or more of carbon. Sellers report liberal contracting for both alloys by steel companies with the expectation of a heavy steel output in 1925.

Cast Iron Pipe.—While there has been no advance in prices, the market is strong and an early increase in quotations is expected, based partly on the higher cost of pig iron. Consumers are showing interest in cover-

ing next year's requirements and in one case a local user of pipe has contracted for pipe sufficient to carry through the spring. The city of Yonkers, N. Y., has opened bids on about 300 tons of 6-, 8- and 12-in. pipe, the low bidder on which was the Warren Foundry & Pipe Co. We quote per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, \$55.60 to \$56.60; 4-in. and 5-in., \$60.60 to \$61.60; 3-in., \$70.60 to \$71.60, with \$5 additional for Class A and gas pipe. Demand for soil pipe continues active and discounts have been advanced 2½ points. Discounts of both Northern and Southern makers of soil pipe, f.o.b. New York, are as follows: 6-in., 40% to 41½ per cent off list; heavy, 50 to 51½ per cent off list.

Warehouse Business.—Quietness has ruled since the spurt of buying early in December and, excepting a few lines, there is little prospect of greater activity until the beginning of the new year. Prices are uniformly firm. Bolt and nut prices have not yet been marked up relatively with the new schedule adopted by makers a week ago, but the sales force at one warehouse has been advised to expect some such change. Business in these products is good. Shafting and screw stock prices are firm at the new levels established last week at 4.15c. for rounds and 4.65c. for squares and flats. Prices are given on page 1662.

Finished Iron and Steel.—Buying is notably active and in some lines, such as sheets, specifications are being released against first quarter contracts. An increased demand for wire nails has also developed and business has been at the 2.85c. price. Indications are that there will be pressure for delivery throughout the month, though output may fall off during the holiday week when mill workers commonly extend the celebrations beyond the one day. Better demand is noted in structural shapes, and tin plate bookings have been heavy with 100,000 boxes for an oil company likely to be bought at this writing. Plates are obtainable this year on new orders, though the plate situation is stronger than in many months. Spikes have been advanced, the new quotation being \$2.90 per 100 lb., base, for 9/16-in. and larger, and \$3.10 for 1½-in. and smaller.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, 2.44c.; plates, 2.24c. to 2.29c.; structural shapes, 2.34c. to 2.44c.; bar iron, 2.34c.

Old Material.—Activity has subsided considerably, but prices on all grades are firm, with an upward trend. Brokers are buying No. 1 heavy melting steel delivered to eastern Pennsylvania consumers at \$19 to \$19.75 per ton, with \$18.35 per ton delivered offered in one instance. Rails for rolling are stronger and have advanced 50c. per ton. Machine shop turnings and borings and turnings both show advances of 50c. per ton, brokers offering \$15.75 to \$16.25 per ton delivered on turnings and \$13.50 to \$14 per ton delivered on borings and turnings. Stove plate is unchanged at \$16.50 per ton delivered to an eastern Pennsylvania consumer and \$14.50 per ton to a local New Jersey consumer. Specification pipe is strong and brokers are paying up to \$18 per ton to fill on contracts. A resumption of buying by the mills is expected after the first of the year.

Buying prices per gross ton New York follow:

Heavy melting steel, yard.....	\$14.00 to \$14.50
Heavy melting steel, railroad or equivalent	15.50 to 16.00
Rails for rolling	16.00 to 16.50
Relaying rails, nominal	24.00 to 25.00
Steel car axles.....	20.00 to 20.50
Iron car axles	27.00 to 28.00
No. 1 railroad wrought.....	15.50 to 16.00
Forge Fire	12.00 to 12.50
No. 1 yard wrought, long.....	14.50 to 15.00
Cast borings (steel mill)	11.50 to 12.00
Cast borings (chemical)	17.00 to 18.00
Machine shop turnings.....	12.00 to 12.50
Mixed borings and turnings.....	10.50 to 11.00
Iron and steel pipe (1 in. diam., not under 2 ft. long).....	13.75 to 14.25
Stove plate	12.50 to 13.00
Locomotive grate bars.....	13.00 to 13.50
Malleable cast (railroad)	14.50 to 15.00
Cast iron car wheels.....	16.00 to 17.00
No. 1 heavy breakable cast.....	13.75 to 14.25

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast.....	\$17.00 to \$17.50
No. 1 heavy cast (columns, building materials, etc.), cupola size	15.00 to 15.50
No. 2 cast (radiators, cast boilers, etc.)	14.00 to 14.50

Boston

Foreign Pig Iron Becoming More and More a Market Factor

BOSTON, Dec. 16.—Pig iron buying has suffered another relapse, although the market is by no means dull. It appears that a Rhode Island melter bought fully 5000 tons of basic, second quarter delivery, instead of 2000 tons as first reported. Five different contracts were made with foreign and Pennsylvania furnace interests. A Connecticut foundry is in the market for 1000 tons No. 2X and No. 1X, for first quarter, and another Connecticut foundry for a large tonnage of basic. A Massachusetts textile machinery maker is considering the purchase of 500 to 1000 tons No. 2X and No. 1X, second quarter delivery. One India furnace is practically sold up for first quarter, 1925, and another is more or less limited on accepting business owing to the ocean steamer space situation. French, German, Belgian and Dutch irons are becoming more and more a factor in this market at delivered prices slightly below those quoted on domestic.

We quote delivered prices on the basis of the latest reported sales as follows, having added \$3.65 freight from eastern Pennsylvania, \$4.91 to \$5.92 from western Pennsylvania; \$4.91 from Buffalo, \$5.92 from Virginia and \$9.60 from Alabama:

East. Penn., sil.	1.75 to 2.25	\$25.65 to \$26.65
East. Penn., sil.	2.25 to 2.75	26.15 to 27.15
West. Penn., sil.	1.75 to 2.25	26.91 to 27.91
West. Penn., sil.	2.25 to 2.75	26.91 to 28.41
Buffalo, sil.	1.75 to 2.25	26.91 to 27.91
Buffalo, sil.	2.25 to 2.75	27.91 to 28.91
Virginia, sil.	1.75 to 2.25	29.42 to 29.92
Virginia, sil.	2.25 to 2.75	29.92 to 30.42
Alabama, sil.	1.75 to 2.25	28.60 to 29.60
Alabama, sil.	2.25 to 2.75	29.10 to 30.10

Cast Iron Pipe.—Bids closed Dec. 16 on 100 tons 6-in., 250 tons 8-in., 400 tons 10-in., 800 tons 12-in., 200 tons 16-in., 350 tons 24-in., 40 tons 30-in., 30 tons 40-in., and 30 tons 42-in., a total of 2200 tons of pipe and approximately 300 tons fittings, spring delivery, required by Boston. Bids closed Dec. 17 on 400 tons 24-in. pipe for Fitchburg, Mass. The Warren Foundry & Pipe Co. is awarded 200 tons small pipe, spring delivery, by Concord, N. H. Otherwise awards reported are for small tonnages. Pipe foundries have booked substantial tonnages for early 1925 delivery and have advanced prices approximately \$2 a ton. New prices are: Class B, 4-in. and smaller, \$66.10 delivered Boston common rate points; 6-in. to 16-in., \$61.10; 20-in. and larger, \$60.10. Differentials of \$4 to \$5 are asked on Class A and gas pipe. The Providence Gas Co., Providence, R. I., is reported to have placed 6000 to 7000 tons of gas pipe, but details are withheld. A Massachusetts gas company also has placed several thousand tons. Domestic foundries are meeting competition from foreign made pipe, especially gas pipe.

Finished Material.—Prices on finished steel are strong and predictions of higher prices by mill representatives common. Plates are now quoted \$2.26½ to \$2.31½ per 100 lb. delivered Boston, freight allowed or \$1.90 to \$1.95 mill, contrasted with \$1.85 heretofore and \$1.75 a month ago. Structural shapes are \$2.36½ to \$2.46½ per 100 lb. delivered or \$2 to \$2.10 mill. Bars are firm at \$2.46½ delivered. Standard bolts and nuts, first quarter shipment, are 50, 10 and 10 per cent discount delivered Boston, in lots of 1000 lb. or more, as against 60 and 10 per cent discount f.o.b. Pittsburgh, heretofore. The freight from Pittsburgh to Boston is 42c. per 100 lb. Stove bolts are 80 and 5 per cent discount delivered, contrasted with 80, 10 and 5 per cent Pittsburgh, heretofore, and cap screws 80 per cent discount delivered, as against 80, 10 and 10 per cent discount Pittsburgh, heretofore. Shafting is approximately 10 per cent higher at 2.80c. f.o.b. mills, and some rollers are asking 10 per cent more for cold steel. It is difficult to obtain prompt structural shape shipments from mills. One of the largest rollers is a week behind on entering of orders and is out of the market on prompt shipment material.

Warehouse Business.—Black and galvanized sheet prices have been advanced 15c. per 100 lb., but ware-

house prices otherwise remain unchanged. Black sheets, three bundles or more, are now \$5.10 per 100 lb. base, and galvanized \$6.15. Blue annealed are unchanged at \$3.91½ per 100 lb. base.

Coke.—The delivered price on by-product foundry coke is unchanged at \$12.50 a ton. Foundry specifications against 1924 contracts are increasing, largely for stocking purposes, although numerous instances are cited where foundries are consuming more fuel.

Old Material.—During the past week \$16, \$16.50, \$17 and even as high as \$17.50 on cars was paid for chemical borings for New Jersey delivery, the extreme top price representing an advance of \$4 a ton within a month. Buyers, however, are placing no new contracts and the largest scrap operators in this territory today will not pay more than \$14.50 to \$15, or \$1 less than a week ago for such material. Average prices paid for steel the past week were \$14.50 to \$15.50 on cars, an advance of 50c. a ton, but as low as \$13.50 on cars was paid for a Rhode Island plant's requirements.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast	\$19.50 to \$21.00
No. 2 machinery cast	17.00 to 18.00
Stove plates	15.00 to 15.50
Railroad malleable	18.00 to 18.50

The following prices are offered per gross ton lots, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	\$14.50 to \$15.00
No. 1 railroad wrought	14.50 to 15.00
No. 1 yard wrought	13.50 to 14.00
Wrought pipe (1-in. in diam., over 2 ft. long)	12.50 to 13.00
Machine shop turnings	12.00 to 12.50
Cast iron borings, chemical	14.50 to 15.00
Cast iron borings, rolling mill	10.50 to 11.00
Blast furnace borings and turnings	9.50 to 10.25
Forged scrap	10.50 to 11.00
Bundled skeleton	10.50 to 12.00
Bundled cotton ties	10.00 to 11.00
Forged flashings	11.50 to 12.00
Shafting	18.50 to 20.00
Street car axles	18.50 to 19.00
Rails for rerolling	15.00 to 15.50
Scrap rails	14.50 to 15.00

St. Louis

Round Tonnage of Basic Sold by a Local Furnace—More Advances in Scrap

ST. LOUIS, Dec. 16.—An East Side melter bought 10,000 tons of basic pig iron from the St. Louis Coke & Iron Co. for first quarter delivery, and a manufacturer of heating apparatus is in the market for 12,000 to 15,000 tons of foundry iron for its plants in Missouri and Illinois for first half delivery. Most melters are inclined to hold off purchases in view of the prospect of closing down for the holiday inventory season, but some are asking makers to ship in advance of contract schedules. Some of the larger melters in the district are so busy that the holiday closing will be shortened to a week. Two Iowa melters are in the market for 700 to 1000 tons of foundry iron. The market is strong, with Northern iron at \$22, Chicago, and Southern \$19 to \$20, Birmingham.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices \$2.16 freight from Chicago, \$3.28 from Florence and Sheffield (rail and water), \$5.17 from Birmingham, all rail, and 81c. average switching charge from Granite City:

Northern fdy., sil. 1.75 to 2.25	\$24.16
Northern malleable, sil. 1.75 to 2.25	24.16
Basic	24.16
Southern fdy., sil. 1.75 to 2.25 (rail)	24.17 to 25.17
Southern fdy., sil. 1.75 to 2.25 (rail and water)	22.28 to 23.28
Granite City Iron, sil. 1.75 to 2.25	23.81 to 24.31

Coke.—By-product ovens report a better demand for foundry coke by consumers in the district, and some fairly large size contracts have been made. One contract of 1300 tons, two of 600 tons and a number for 300 tons are reported. Granite City coke is offered at \$9, ovens, with 50c. a ton freight on terminal lines

and 80c. on other lines; Warren and Indianapolis brands are sold at \$11.40, delivered St. Louis. A slight improvement in domestic grades is reported.

Finished Iron and Steel.—Only a fair volume of small orders for finished iron and steel is reported for the week. The placing of large orders seems over for the present. Manufacturers and jobbers alike are pressing for deliveries, indicating stocks are low. Railroad buying is extremely light.

For stock out of warehouse we quote: Soft steel bars, 3.15c. per lb.; iron bars, 3.15c.; structural shapes, 3.25c.; tank plates, 3.45c.; No. 10 blue annealed sheets, 3.90c.; No. 28 black sheets, cold rolled, one pass, 4.65c.; cold rolled rounds, shafting and screw stock, 3.95c.; structural rivets, 3.65c.; boiler rivets, 3.85c.; tank rivets, $\frac{1}{8}$ in. diameter and smaller, 70 per cent off list; machine bolts, 55 per cent; carriage bolts, 50 per cent; lag screws, 60 per cent; hot pressed nuts, squares, \$3.50; hexagons, blank or tapped, \$4 off list.

Old Material.—Further advances in a number of items in the list of old material are recorded. An East Side plant, whose purchase of 10,000 tons of specialties was reported in last week's IRON AGE, bought an additional 4000 this week, and other sales of steel and rolling mill grades were made. Dealers are willing to pay higher prices to obtain material with which to cover. New railroad lists issued during the week include: Baltimore & Ohio, 16,000 tons; Norfolk & Western, 7300 tons; Rock Island, 4500 tons; Missouri-Kansas-Texas, 2000 tons; Northern Pacific, 1000 tons.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton

Iron rails	\$18.00 to \$18.50
Rails for rolling	19.00 to 19.50
Steel rails, less than 3 ft.	19.00 to 19.50
Relaying rails, 60 lb. and under	25.00 to 26.00
Relaying rails, 70 lb. and over	32.50 to 33.50
Cast iron car wheels	18.50 to 19.00
Heavy melting steel	16.50 to 17.00
Heavy shoveling steel	16.25 to 16.75
Frogs, switches and guards cut apart	18.00 to 18.50
Railroad springs	20.50 to 21.00
Heavy axles and tire turnings	13.50 to 14.00
No. 1 locomotive tires	18.50 to 19.00

Per Net Ton

Steel angle bars	16.00 to 16.50
Steel car axles	20.00 to 20.50
Iron car axles	24.00 to 24.50
Wrought iron bars and transoms	20.00 to 20.50
No. 1 railroad wrought	15.00 to 15.50
No. 2 railroad wrought	14.50 to 14.75
Cast iron borings	11.25 to 11.75
No. 1 busheling	15.00 to 15.50
No. 1 railroad cast	18.00 to 18.50
No. 1 machinery cast	19.00 to 19.50
Railroad malleable	15.00 to 15.50
Machine shop turnings	9.00 to 9.50
Champion bundled sheets	10.00 to 10.50

Birmingham

Pig Iron Strong Despite Decrease in Buying—Little Cessation for Holidays

BIRMINGHAM, ALA., Dec. 16.—The lull in the pig iron buying in the South does not affect the strength of the market. The little iron selling carries the \$20 per ton base price. Only one or two furnace companies are in the open market on any business for the coming year, with indications that two or more will remain out for a few weeks yet, having sold freely on the first quarter. Inquiries are being received as to iron for first half of year and so far only a few orders have been booked. Twenty-three blast furnaces are producing in this State, 13 on foundry, one on ferromanganese and nine on basic. The survey to date as to the lay-offs for the holidays shows that not much time is to be lost. One of the larger melters has announced a week's cessation of work, while others have announced closing down on the day previous to Christmas and resuming the Monday after that day.

We quote per gross ton, f.o.b. Birmingham district furnace as follows:

No. 2 foundry, 1.75 to 2.25 sll....	\$20.00
No. 2 foundry, 2.25 to 2.75 sll....	20.50
Basic	\$19.50 to 20.00
Charcoal, warm blast	29.00 to 30.00

Steel.—Active operation of producing mills in this district indicate improving condition of the steel mar-

ket. The Tennessee Coal, Iron & Railroad Co.'s producing mills are going at almost capacity, while 50 per cent of the open-hearth furnace department of the Gulf States Steel Co. is in operation. Finishing mills are doing better than a few weeks since. Inclination is upward as to price on steel. Soft bars are quoted at 2.25c. to 2.30c. Birmingham.

Cast Iron Pipe.—Gas and water pipe producers in the Birmingham district have been getting in lettings steadily, the total business being more satisfactory than at this time a year ago. Quotations are higher and are now on a basis of about \$40 on 6-in. and over.

Coke.—Better demand for coke is announced though quotations are unchanged. By-product foundry coke is being quoted at \$4.50 to \$5 and even \$5.25. Independent producers are enjoying steady business, with prospects of future bright.

Old Material.—The scrap market shows much improvement and quotations stronger though not advanced for this week. Consumers are manifesting interest in old material and higher prices for pig iron will bring about demand for certain of the grades.

We quote per gross ton f.o.b. Birmingham district yards as follows:

Cast iron borings, chemical	\$15.00 to \$16.00
Heavy melting steel	14.00 to 14.50
Railroad wrought	13.00 to 14.00
Steel axles	17.00 to 18.00
Iron axles	19.00 to 19.50
Steel rails	14.00 to 14.50
No. 1 cast	16.00 to 17.00
Tramcar wheels	16.00 to 17.00
Car wheels	15.00 to 16.00
Stove plate	14.00 to 15.00
Machine shop turnings	7.00 to 8.00
Cast iron borings	7.00 to 8.00
Rails for rolling	15.00 to 16.00

Cincinnati

American Radiator Co. Inquiring for Large Tonnage of Pig Iron

CINCINNATI, Dec. 16.—The American Radiator Co. is inquiring for 3800 tons of pig iron for Springfield, Ohio, and 9000 tons for Birmingham plants, and its total inquiries for second quarter are close to 30,000 tons. This is the feature of the market. Sales during the past week were mainly for small tonnages, though for special grades there was some activity. We note one sale of 1000 tons of charcoal iron at \$26, furnace, and 600 tons of low phosphorus at an undisclosed price. Southern iron is firm at \$20, Birmingham, and one furnace interest reports small lot sales at \$20.50. In southern Ohio it is still possible to do \$21.50 on attractive tonnages, but small tonnages for first quarter are being booked at \$22, Ironton. With the exception of the inquiry noted above, there is little interest manifested in the market, and it is expected that it will be quiet until after the new year. Norton and Belfont furnaces are expected to blow in next week.

Based on freight rates of \$4.05 from Birmingham and \$2.27 from Ironton we quote f.o.b. Cincinnati:

Southern fdy., sil. 1.75 to 2.25 (base)	\$24.05
Southern fdy., sil. 2.25 to 2.75	24.55
Southern Ohio silvery, 8 per cent	\$31.77 to 32.77
Southern Ohio fdy., sil. 1.75 to 2.25	23.77 to 24.27
Southern Ohio, basic	23.27
Southern Ohio, malleable	23.77 to 24.27

Sheets.—Some mills report order books for blue annealed and galvanized sheets practically filled for first quarter shipment. Demand for this delivery continues strong. The low prices of several weeks ago have disappeared, and mills are now generally quoting 2.70c., 3.60c. and 4.75c. respectively, f.o.b. Pittsburgh, for blue annealed, black and galvanized sheets for first quarter delivery.

Structural Activity.—The only important inquiry is for approximately 2000 tons, for an addition to the Starks Building, Louisville, Ky. No awards of consequence are reported.

Reinforcing Bars.—Prospective business is exceptionally impressive, but it is now expected that it will

be the first of the year before any of the larger projects contemplated are brought out. An inquiry for 100 tons for the Groton Building, Cincinnati, is being figured. There were no important awards. Prices of reinforcing bars range from 1.95c. for rail steel bars, to 2.10c., Pittsburgh, for new billet stock.

Warehouse Business.—Jobbers report business continues fair, but a falling off is expected between now and the end of the year. This is customarily a dull period. Prices are steady, and while nothing official is at hand, an advance of \$2 per ton in cold-rolled products is expected.

Cincinnati jobbers quote: Iron and steel bars, 3.30c.; reinforcing bars, 3.30c.; hoops, 4.35c.; bands, 3.95c.; shapes, 3.40c.; plates, 3.40c.; cold-rolled rounds, 4.05c.; cold-rolled flats, squares and hexagons, 4.55c.; open-hearth spring steel, 4.75c. to 5.75c.; No. 10 blue annealed sheets, 3.90c.; No. 28 black sheets, 4.60c.; No. 28 galvanized sheets, 5.75c.; No. 9 annealed wire, \$3.15 per 100 lb.; common wire nails, \$3.15 per keg base; cement coated nails, \$2.85 per keg.

Finished Materials.—Buying has been light for the past week or ten days, and it is not expected that there will be much more business placed until after the new year. A great many of the consumers of finished steel have covered for at least part of their first quarter requirements, and shipments are coming through in good time on December specifications, which are heavier than usual for this month. Prices are steady, plates being quoted at 1.90c., Pittsburgh, shapes and bars at 2.10c., Pittsburgh. There has been a fairly heavy demand for wire nails, and total sales of 13,000 kegs to four large jobbers are reported by a nearby mill. Prices are firm at \$2.85 per keg, mill. Wire products are moving in fair volume, and most mills report good bookings for delivery up to Feb. 15. There has been little activity in bolts and nuts, as jobbers are carrying fairly large stocks, and are not in a hurry to cover for first quarter. Light rails are in slight demand. The Big Four Railroad is expected to close for a large tonnage of track accessories this week, including track bolts, tie plates, angle bars and spikes.

Coke.—The market for coke is showing some improvement. Shipments of foundry coke this month are 20 per cent heavier to date than in November. Prices are steady with Connellsville district showing an advance of 25c. on furnace grades. Quotations are as follows: Connellsville furnace, \$3.75; foundry, \$4.50 to \$5.50; New River foundry, \$8.50; Wise County furnace, \$3.50; foundry, \$4.25 to \$5.50; by-product foundry, \$6.50, Connellsville basis.

Old Material.—There was some selling of cast grades during the past week, but mostly in small tonnages. Steel grades for shipment into this district are quiet. Prices, however, are advancing in sympathy with other markets, and dealers paid higher prices for railroad scrap last week than could be secured from consumers.

We quote dealers' buying prices, f.o.b. cars, Cincinnati:

Per Gross Ton

Heavy melting steel	\$16.00 to \$16.50
Scrap rails for melting	15.50 to 16.00
Short rails	19.00 to 19.50
Relying rails	30.50 to 31.00
Rails for rolling	17.00 to 17.50
Old car wheels	15.00 to 15.50
No. 1 locomotive tires	17.50 to 18.00
Railroad malleable	17.00 to 17.50
Agricultural malleable	16.00 to 16.50
Loose sheet clippings	13.00 to 13.50
Champion bundled sheets	14.00 to 14.50

Per Net Ton

Cast iron borings	12.00 to 13.00
Machine shop turnings	11.00 to 11.50
No. 1 machinery cast	18.50 to 19.00
No. 1 railroad cast	16.50 to 17.00
Iron axles	22.50 to 23.00
No. 1 railroad wrought	13.00 to 13.50
Pipes and flues	9.50 to 10.00
No. 1 busheling	11.50 to 12.00
Mixed busheling	9.50 to 10.00
Burnt cast	12.00 to 12.50
Stove plate	12.00 to 12.50
Brake shoes	13.00 to 13.50

San Francisco

Price Tendencies Firmer—Forward Bookings Improve—Sheets and Tin Plate Active

SAN FRANCISCO, Dec. 12 (*By Air Mail*).—Strengthening factors are apparent, the current volume of business and the number of inquiries are substantial, for this time of the year, and forward bookings are much larger than had been expected a few weeks ago. Among the outstanding developments of the past week were the following:

An advance of \$1 a ton on Birmingham, Ala., pig iron was made effective, making the delivered price in San Francisco now \$30.75. An advance in the price of Birmingham, Ala., by-product coke is expected within a week or ten days. A prominent independent maker of sheets secured a contract involving several thousand tons for first quarter shipment. Orders for tin plate totaling 286,600 base boxes were placed with a large independent maker, and structural steel projects involving 5240 tons were awarded.

The recent decision of the Treasury and Navy departments to make San Francisco the buying center for supplies for the area west of the Rockies will mean millions of dollars additional business not only for this city, but for the entire Pacific Coast.

Pig Iron.—Inquiries for several thousand tons of both domestic and foreign pig iron, mostly of foundry grades, have been made during the past ten days. The market is stronger, Birmingham, Ala., iron being advanced in price \$1 a ton, making the delivered price here \$30.75. Prices of foreign irons are unchanged, and somewhat better prices than the prevailing quotations are obtainable for round tonnages. First quarter bookings have been fairly heavy, and current business is of fair volume.

	Per Ton
Birmingham, Ala., foundry iron, sil. 2.75 to 3.25 delivered in San Francisco	\$30.75
Utah basic, delivered in San Francisco	27.25
Utah foundry, sil. 1.75 to 2.25 delivered	27.50
Scotch foundry, duty paid, f.o.b. cars, shipside	\$30.00 to 32.00
English foundry, duty paid, f.o.b. cars, shipside	28.50 to 30.00
Belgian foundry, duty paid, f.o.b. cars, shipside	26.00 to 28.00
Indian foundry, duty paid, f.o.b. cars, shipside	26.00 to 28.00
German foundry, duty paid, f.o.b. cars, shipside	26.00 to 28.00

Coke.—An advance of \$1 is expected to be made shortly in Birmingham, Ala., by-product coke, which is quoted at present at \$18 to \$20 delivered. West Virginia beehive delivered is \$25 to \$27, and English coke, foundry grades, is about \$16.50 to \$18, duty paid, f.o.b. cars, shipside, San Francisco. Current inquiries are mostly for small shipments.

Ferroalloys.—Orders for ferrosilicon have been fairly large and have been well booked ahead, although occasional inquiries are heard. The prevailing quotation on Swedish ferrosilicon is about \$88, duty paid, San Francisco. Ferromanganese is quiet at \$107.50 for English grades, duty paid, San Francisco.

Plates.—Inquiries are fairly large. Current quotations are 2.40c. to 2.45c., base, c.i.f. An order for 1000 tons was placed recently with one of the prominent independent mills by the Associated Oil Co.

Shapes.—Awards made during the past week totaled 5240 tons, and jobs involving more than 20,000 tons are still outstanding. Current quotations are 2.45c. to 2.55c., base, c.i.f. Foreign girders are being offered at 1.85c., duty paid, up to 35 ft. lengths. The largest single award of the week was to the Moore Dry Dock Co., 4000 tons for the Dumbarton Point Highway Bridge, San Mateo County.

Bars.—Concrete structural projects requiring several thousands tons of reinforcing bars are pending, and warehouse business for soft steel bars is of fairly good volume.

Quotations are as follows: Reinforcing bars, under 2.50 tons, 2.25c. More than 250 tons, 3.10c. to 3.25c. Soft steel bars, carload, mill shipment, 2.50c. to 2.60c. Soft steel bars, from warehouse, l.c.l., \$3 base. Soft steel bands, from warehouse, l.c.l., \$2.75 base.

Sheets.—The outstanding development of the past week was the securing of a contract by a prominent independent maker calling for several thousand tons of sheets for first quarter shipment. Recent bookings have been substantial, and some of the local mills have virtually closed their books temporarily.

Current quotations are as follows: Blue annealed, 3.45c., c.i.f., black, 4.35c., c.i.f. galvanized, 5.50c. to 5.95c., c.i.f.

Tin Plate.—Current business is fairly large. A prominent independent maker secured orders during the past week calling for about 286,600 base boxes from the following users: Standard Oil Co., 143,600; Alaska Packers, 45,000; Western Can Co., 70,000 to 80,000; Naknek Packing Co., 10,000; Alaska Salmon Co., 8000. The current quotation in this market is \$5.50, 100 lb. box, Pittsburgh.

Old Material.—No change in prices nor in demand has been noted during the past week. Stocks in yard are ample. The price of heavy melting steel holds steady at \$11. The price in Los Angeles is \$10. The amount of material on hand in the southern city is more than adequate for all immediate requirements.

Prices for scrap delivered to consumers' yards are as follows:

	Per Gross Ton
No. 1 heavy melting steel.....	\$11.00 to \$12.00
Scrap rails, miscellaneous.....	11.00 to 12.00
Rolled steel wheels.....	11.00 to 12.00
Couplers and knuckles.....	11.00 to 12.00
Mixed borings and turnings.....	6.00 to 6.50
Country mixed cast scrap.....	8.50 to 9.00

Cleveland

Heavy Specifying of Some Finished Products —Fairly Active Pig Iron Market

CLEVELAND, Dec. 16.—Following a heavy rush in specifications which continued through last week, the steel market has quieted down, although there is still a moderate volume of small lot buying. Many consumers have specified heavier tonnages, principally in steel bars, than was expected, covering a large part of their first quarter requirements, for fear that if they deferred their specifications until next month there would be such a rush of orders that deliveries would be undoubtedly delayed. In the automotive field a maker of car frames and other automobile stampings placed a contract during the week with a Cleveland mill for in excess of 50,000 tons of steel, including light plates, strip steel and sheets for the first half. This contract is understood to have been taken at some concessions from regular quotations. However, as a rule the automobile industry is following a cautious policy in making steel commitments and in planning production schedules. New construction work is coming out in good volume. The Biggs Boiler Works, Akron, Ohio, has taken a water pipe line for Flint, Mich., which will require 2000 tons of $\frac{3}{8}$ -in. plates which is reported placed with an independent mill. There is an inquiry for a pipe line in St. Louis which will require 6000 to 8000 tons of plates. In the building field an inquiry is out for an office and theater building in Detroit requiring 7000 tons of structural material and a large amount of other structural work is in prospect in that city. The Hocking Valley Railroad is taking bids on car repair work requiring 550 tons of plates. It is expected that action on rail inquiries pending in this territory aggregating over 20,000 tons will be deferred until January.

Pig iron producers are disturbed because notices of an advance in wages have been posted in the Connellsville coke district which will mean higher coke prices under their contracts and some have withdrawn from the market to await developments. In the meantime a large consumer has come into the market for a heavy tonnage for the second quarter.

Jobbers quote steel bars, 3.10c.; plates and structural shapes, 3.20c.; No. 28 black sheets, 4.35c.; No. 28 galvanized sheets, 5.45c.; No. 10 blue annealed sheets, 3.45c. to 3.60c.; cold-rolled rounds, 4c.; flats, squares and hexagons, 4.50c.; hoops and bands, 1 in. and wider and 20 gage and heavier, 3.85c.; narrower than 1 in., all gages, 4.35c.; No. 9 annealed wire, \$3.15 per 100 lb.; No. 9 galvanized wire, \$3.60 per 100 lb.; common wire nails, \$3.25 base per 100 lb.

Pig Iron.—The market is still active and prices are generally fully 50c. a ton higher than a week ago. The American Radiator Co., which recently bought a round tonnage for the first quarter, has come into the market for iron for its second quarter requirements for all its plants. Its inquiry for Central Western plants includes 10,000 tons for Detroit and 3800 tons for Springfield, Ohio. With the possibility of a second quarter buying movement getting under way, producers who depend on Connellsville coke are becoming worried over the coke situation, fearing an advance in wages and higher coke prices because of the wage clause in coke contracts. It is claimed that the enforcement of the wage clause will increase the cost of making pig iron with beehive coke from \$1 to \$1.25 a ton. Most producers are declining to quote prices for the second quarter. Sales during the week by Cleveland interests aggregated 30,000 tons, including two 5000-ton lots taken by Lake furnaces, one of which was placed with a Buffalo furnace by a consumer in that territory. Both Cleveland producers have advanced foundry and malleable iron, one 50c. a ton and one \$1 a ton, and sales have been made at the higher quotation of \$22.50 furnace for both Cleveland delivery and outside shipment. Both producers are virtually sold up for the first quarter. The Lake furnace price outside of Cleveland ranges from \$21.50 to \$22, one furnace having made a 50c. advance. The same spread prevails in Michigan. The Valley market is firm at \$21, with one producer quoting \$22. Basic iron is firmer and probably cannot be bought under \$21. The Andrews Steel Co. is inquiring for 25,000 tons of basic for the first half and an Alliance consumer is asking for 5000 tons or more. An inquiry for 500 to 1000 tons of Bessemer iron has brought out a \$21 quotation from a Valley furnace, although Pittsburgh reports sales at \$21.50. Low phosphorus iron in the Valley ranges from \$28 for standard to \$28.50 for high silicon. We note the sale of 300 tons of the former at \$28. Southern foundry iron is firm at a minimum of \$20 and one or two producers have advanced their price to \$20.50. We note the sale of 250 tons of Michigan charcoal iron at the recently prevailing price of \$26.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a \$3.02 freight rate from Jackson and \$6 rate from Birmingham:

Basic, Valley furnace.....	\$21.00
N'th'n No. 2 fdy, sll. 1.75 to 2.25	22.50 to 23.00
Southern f'dy, sll. 1.75 to 2.25..	26.01 to 26.51
Malleable.....	22.50 to 23.00
Ohio silvery, 8 per cent.....	32.52 to 33.52
Stand. low phos., Valley furnace	28.00 to 29.50

Iron Ore.—With the improvement in the iron and steel industry, ore men are looking for a good demand for ore next year and a fair season's movement. The amount of Lake Superior ore at furnaces and Lake Erie docks Dec. 1 was approximately 39,600,000 tons, and it is expected that the amount will be considerably below normal when navigation opens May 1. Figures prepared by an official of one of the ore companies indicate that the amount of ore on docks and furnace yards May 1 will be 3,910,000 less than the normal average of 19,810,226 tons for the past 13 years. These figures are based on the assumption that the pig iron production will average 3,220,000 tons per month from December to April inclusive.

Bolts and Nuts.—Considerable business in first quarter contracts is being booked at the new prices announced last week, the present prices being f.o.b. factory, with freight allowed to destination. While some bolt and nut manufacturers are trying to place quantity differentials into effect with a spread of 5 per cent in quotations, others are naming only one set of prices or the maximum discounts published in our price table last week and indications are that these lower prices will generally prevail except for small lot orders.

Rivets.—Despite recent talks of an advance, prices for the first quarter have been established at 2.60c. Pittsburgh or Cleveland for large rivets and 70, 10 and 5 per cent off list for small rivets or the same that have prevailed during the present quarter. The leading local manufacturer who has recently been using Cleveland

as a basing point is now quoting a Pittsburgh base for Eastern shipment in order to meet the competition of Pittsburgh district makers. For this territory Cleveland is still used as the basing point.

Steel Bars, Plates and Structural Material.—Both local mills and a few other independent mills have advanced plates to 2c., Pittsburgh, and one producer is quoting 2.10c. for car lots, at which sales have been made. However, 1.90c. is still being quoted. Steel bars are firm in this territory at 2.10c., Pittsburgh, or 2.29c., Cleveland, at which some business is being taken, although the 2c. price does not seem to have entirely disappeared in some sections. Structural material is commonly quoted at 2.10c., although one mill is still on the 2.05c. basis.

Semi-Finished Steel.—Considerable inquiry is still coming out, particularly for sheet bars for the first quarter. A local mill sold a 12,000-ton lot during the week and has now withdrawn from the market, being sold up for the first quarter. Two or three other mills have no semi-finished steel to offer. While the market generally is firm, an Ohio mill was able to buy slabs during the week on a basis of \$35, Youngstown, or 50c. under the generally quoted price.

Sheets.—Blue annealed sheets are firmer and two local mills that were on the 2.60c. base have advanced to 2.70c. The market is not active, buying being generally confined to early requirements. Many consumers are under contract at recent prices and mills report that they could take considerable more first quarter business if they would quote 3.50c. for black and 4.60c. for galvanized. Sheets can still be bought at these prices for early shipment, although the market is firm at regular quotations for contracts. On auto body sheets, 4.60c. is still being quoted for early delivery.

Strip Steel.—Wide hot-rolled strip steel has stiffened and quotations now range from 2.25c. to 2.40c. Bands are quoted at 2.40c. and hoops at 2.50c. Cold-rolled steel is still being rather commonly quoted at 4c.

Reinforcing Bars.—Rail steel bars are now firm at 1.90c., Pittsburgh, and 2.10c. is the common quotation on new billet steel bars, although a round lot would probably bring out a price of 2c. or lower.

Coke.—Two or three producers who have been quoting Connellsburg foundry coke at \$4.25 advanced their prices during the week to \$4.50 and other prices range up to \$5.50. Some producers have commenced to insert wage clauses in foundry coke contracts. Most consumers are under first quarter contracts.

Old Material.—Prices have advanced 25c. to 50c. a ton on most grades and the market is very firm, but not active. A Warren mill during the week paid \$21.50 for No. 1 heavy melting steel and \$20.50 for No. 2. Locally dealers are asking 17 to \$17.50 for machine shop turnings. No scrap is being offered except in small lots and advances in prices are not bringing out yard stocks. Shipments are heavy and two local mills held up on shipments during the week.

We quote dealers' prices f.o.b. Cleveland per gross ton:

Heavy melting steel	\$18.75 to \$19.00
Rails for rolling	18.75 to 19.00
Rails under 3 ft.	21.00 to 21.50
Low phosphorus melting	21.50 to 22.00
Cast iron borings	16.00 to 16.25
Machine shop turnings	15.75 to 16.00
Mixed borings and short turnings	16.00 to 16.50
Compressed sheet steel	16.00 to 16.50
Railroad wrought	16.00 to 16.50
Railroad malleable	19.50 to 19.75
Light bundled sheet stampings	13.75 to 14.00
Steel axle turnings	16.50 to 17.00
No. 1 cast	20.00 to 20.50
No. 1 busheling	15.50 to 16.00
Drop forge flashings	14.75 to 15.25
Railroad grate bars	16.00 to 16.25
Stove plate	16.00 to 16.25
Pipes and flues	14.25 to 14.50

Railroad officials look for heavy traffic throughout the Youngstown district over the winter, due to inbound movement of raw materials to steel properties, and outbound movement of raw materials to steel properties, and outbound shipments of iron, semi-finished and finished steel. The traffic movement in the district is now at 80 per cent of normal, an increase of 20 per cent since the election Nov. 4.

Philadelphia

Demand Lighter—Tonnage of Basic Closed—Round Lot of Heavy Melting Steel Bought

PHILADELPHIA, Dec. 16.—Well covered for the immediate future, consumers in most lines are inclined to await the development of more active demand for their products before covering their needs further into the future. Prices, however, continue to advance. Expected increases in the cost of coke are contributing to greater firmness in the pig iron market and a \$25 second quarter market seems confidently expected in some quarters. Basic iron continues strong and active. A large eastern Pennsylvania producer of plates closed in the past week on 12,000 tons of basic. Continental foundry iron, contracted for by sellers in this district, has not as yet been widely offered to consumers in view of the upward movement of domestic prices.

While the small miscellaneous specifications on finished products, which in a normal market are considered warehouse business, are still acceptable on occasion by some mills, less interest is manifested in this type of business, except where the specifications satisfactorily fill out a rolling schedule. Of the business still coming out as the year draws to a close, the railroads continue to provide a liberal portion. The Pennsylvania Railroad has released about 25,000 tons of rails, the residue of its 1924 tonnage, which it was expected would go over into next year and is reported to have sent out inquiries on part of its 1925 requirements. Both the Pennsylvania and the New York Central have been in the market for plates to be used in car repairs. Spikes have been advanced \$2 per ton at Philadelphia, New York and Pittsburgh basing points.

Pig Iron.—Consumers of foundry iron are, as a rule, confining inquiries to small lots, a condition that is expected to continue until after the first of the year. Although \$23 is still obtainable on small lots for early shipment, the first quarter quotation is evidently firm at \$23.50 base. The Alan Wood Iron & Steel Co. has blown in No. 3 furnace at Swedeland on foundry and will probably change one of the furnaces previously in blast on foundry to basic. Basic has been active and quotations continue their upward movement. One interest, after booking a total of 5200 tons, recently increased its quotation. A large producer of plates in eastern Pennsylvania has closed on 12,000 tons of basic at a low delivered price that, because of the small transportation charge, figured back to \$23, furnace. While this would tend to establish the market at \$23 base, sellers claim that it is doubtful that less than \$23.50 base could be done today. Virginia iron is higher in price, but the market is quiet. Gray forge and malleable are quotable at advances, but demand is light.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76c. to \$1.63 per gross ton:
East. Pa. No. 2 plain, 1.75 to 2.25
sil. \$22.76 to \$24.62
East. Pa. No. 2X, 2.25 to 2.75 sil. 24.51 to 25.38
East. Pa. No. 1X. 25.51 to 26.38
Virginia No. 2 plain, 1.75 to 2.25
sil. 29.17 to 29.67
Virginia No. 2X, 2.25 to 2.75 sil. 29.67 to 30.17
Basic delivered eastern Pa. 23.50 to 24.00
Gray forge 23.50 to 24.00
Malleable 24.00 to 24.50
Standard low phosph. (f.o.b. furnace) 25.50 to 26.50
Copper bearing low phosph. (f.o.b. furnace) 25.50 to 26.00

Billets.—There is little change in the market. Demand is light but prices are holding firmly to a range of \$36.50 to \$37 per ton, Pittsburgh, for rerolling billets and \$41 to \$42 per ton, Pittsburgh, on forging.

Bars.—Steel bars still range from 2c. to 2.10c. per lb., Pittsburgh, the minimum quotation generally prevailing only on the more favorable specifications for early delivery. Mills continue better booked with bar

orders than other finished products. Iron bars have stiffened slightly and 2.15c. per lb., f.o.b. mill, is generally quoted for first quarter, with the 2.05c. per lb. price prevailing only on the more favorable lots.

Shapes.—With fabricators in keen competition for business close figuring of the steel involved in building projects is the rule, and as a result there is perhaps a greater tendency to hold this market down than in the case of other products. The Lynch Construction Co., New York, has asked for bids on the 3000 tons of steel involved in the theater and office building at Broad and Locust Streets. Shapes still range from 1.95c. to 2c. per lb., Pittsburgh, the lower price being for immediate specifications.

Plates.—Plate demand is well maintained. The Pennsylvania and the New York Central are about to close on small lots of plates for car repairs. The market is still strong and ranges from 1.95c. to 2c. per lb., Pittsburgh. Some sellers are quoting 2.10c. per lb. on plates for first quarter delivery.

Spikes.—An advance of \$2 per ton, the second in a few weeks, has been made. Large and small spikes have been increased 10c. per 100 lb. to 2.90c. per lb., Pittsburgh; 3.15c. per lb., Philadelphia, and 3.20c. per lb., New York. The Chicago base continues unchanged.

Old Material.—Buying by consumers seems to have settled into the year end period of quiet with the market on heavy melting steel firmly established at \$21 as the outside price. An eastern Pennsylvania consumer closed this week on 10,000 tons of No. 1 heavy melting steel at \$21 per ton. While the market is quotable at \$20 to \$21 per ton, it is noteworthy that a large consumer in eastern Pennsylvania, enjoying a low freight rate, has not yet come into the market, so that the minimum price on heavy melting steel is difficult to determine. Low phosphorus scrap is firm at \$24 to \$25 per ton, but not overly active this week. Specification pipe is quotable at \$18 to \$18.50 per ton. Heavy breakable cast is more active and prices are firmer at \$18 to \$19 per ton, delivered, than the quotation of \$19.50 to \$20 per ton on No. 1 cast, which shows only nominal activity with the foundry consumers still only light buyers.

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel.....	\$20.00 to \$21.00
Scrap rails	20.00 to 21.00
Steel rails for rolling.....	20.00 to 21.00
No. 1 low phos., heavy 0.04 and under	24.00 to 25.00
Couplers and knuckles	22.50 to 23.50
Rolled steel wheels	22.50 to 23.50
Cast-iron car wheels	19.00 to 19.50
No. 1 railroad wrought.....	21.00 to 22.00
No. 1 yard wrought	18.00 to 19.00
No. 1 forge fire	16.50 to 17.00
Bundled sheets (for steel works)	16.50 to 17.00
Mixed borings and turnings (for blast furnace use)	13.50 to 15.00
Machine shop turnings (for steel works use)	17.00 to 17.50
Machine shop turnings (for rolling mill use)	17.00 to 17.50
Heavy axle turnings (or equivalent)	17.50 to 18.00
Cast borings (for steel works and rolling mills)	15.50 to 16.00
Cast borings (for chemical plants)	20.00 to 21.00
No. 1 cast.....	19.50 to 20.00
Heavy breakable cast (for steel plants)	18.00 to 19.00
Railroad grate bars	16.50 to 17.00
Stove plate (for steel plant use)	16.50 to 17.00
Wrought iron and soft steel pipes and tubes (new specifications)	18.00 to 18.50
Shafting	25.00 to 26.00
Steel axles	25.00 to 26.00

Ferroalloys.—There has been an increase of activity in the past week, with consumers coming into the market for lots of 100 to 500 tons of ferromanganese for first quarter delivery. The expectation of an advance in the price to \$110 per ton, seaboard, or f.o.b. furnace, and the realization of consumers that recent bookings warrant an increase in estimates of first quarter requirements are believed to be the explanation of the greater activity.

Warehouse Business.—Prices continue firm, although but few orders are reported. With the mills adopting a more independent attitude toward ac-

ceptance of the small miscellaneous specifications lately taken by them, sellers from stock look forward to a gradual improvement next month.

Soft steel bars and small shapes, 3.20c.; iron bars (except bands), 3.20c.; round edge iron, 3.50c.; round edge steel, iron finished, 1½ x ¾ in., 3.50c.; round edge steel planished, 4.30c.; tank steel plates, ¼ in. and heavier, 3.10c.; tank steel plates, ½ in., 3.25c.; blue annealed steel sheets, No. 10 gage, 3.75c.; black sheets, No. 28 gage, 4.85c.; galvanized sheets, No. 28 gage, 6c.; square twisted and deformed steel bars, 2.85c.; structural shapes, 3.10c.; diamond pattern plates, ¼-in., 5.30c.; ½-in., 5.50c.; spring steel, 5c.; round cold-rolled steel, 4.05c.; squares and hexagons, cold-rolled steel, 4.55c.; steel hoops, 1 in. and wider, No. 20 gage and heavier, 3.95c.; narrower than 1 in., all gages, 4.45c.; steel bands, No. 12 gage to ½ in., inclusive, 3.95c.; rails, 3.20c.; tool steel, 8.50c.; Norway iron, 7c.

Imports.—In the week ended Dec. 13, a total of 5015 gross tons of pig iron came into the Port of Philadelphia from India. Iron ore imports in this period totaled 6258 gross tons, of which 6158 tons originated in Sweden and 100 tons in Spain. Of Belgian material there was 351 tons of structural steel and 310 tons of blooms.

RAILROAD EQUIPMENT BUYING

Good Car Orders but Inquiry Smaller—Great Northern Buys Four Large Locomotives

Car orders this week totaled 4846, a considerably larger number than the week before, but inquiries dropped off slightly, with 2214 reported. New inquiries include 2044 car bodies. There were 54 locomotives purchased, 50 by the Missouri Pacific and 4 by the Great Northern. These four, of the Mallet type, are said to be the largest ever built and were placed with the Baldwin Locomotive Works.

The Missouri Pacific has placed 50 locomotives in addition to the 50 bought early in October. The order was distributed as follows: 35 Mikado type and 10 Pacific type engines to the American Locomotive Co. and 5 switching engines to the Baldwin Locomotive Works. The same railroad has closed for 3040 freight cars, of which 1000 box, 800 automobile, 200 furniture type and 40 caboose cars were awarded to the American Car & Foundry Co., and 1000 box cars were placed with the General American Car Co.

The Northern Pacific has ordered 800 gondola cars from the Ryan Car Co. and 10 coaches, 5 baggage and 5 mail cars from the Pullman Car & Mfg. Corporation.

The Louisville & Nashville has placed 1000 gondola cars with the Pressed Steel Car Co. and is expected to close this week on 4 coaches, 4 partition coaches, 4 baggage cars, 8 baggage and mail cars and 2 dining car shells.

The Burlington is inquiring for 1000 to 1500 50-ft. automobile cars, in addition to its pending inquiry for 500 to 1000 40-ft. automobile cars.

The Baltimore & Ohio is inquiring for 1000 70-ton gondola cars, 1000 steel box car bodies and 1000 flat car bodies.

The Central of New Jersey has placed 23 coaches with the Standard Steel Car Co. and 5 passenger and baggage cars and 3 club cars with the Bethlehem Steel Corporation.

The New York Central has placed the conversion of 200 box into stock cars and 200 box into flat cars with the Illinois Car & Mfg. Co. It has also ordered 1 passenger and baggage, 1 passenger and trailer and 1 baggage and mail car from the J. G. Brill Co. and is inquiring for 29 steel passenger motor car bodies for suburban service.

The Great Northern has ordered 4 Mallet type locomotives, said to be the largest ever built, from the Baldwin Locomotive Works.

The Western Pacific has ordered 70 stock cars from the Pacific Car & Foundry Co.

The Sinclair Refining Co. is inquiring for trucks for 25 tank cars.

The Virginia Smelting Co. has ordered 2 tank cars from the General American Tank Car Corporation.

The American Steel & Wire Co. is inquiring for 14 gondola cars.

The Colombian Railway & Navigation Co., Colombia, has placed 15 flat cars with the Magor Car Corporation.

The O'Brien Brothers Sand & Gravel Co., Port Washington, Long Island, has ordered 4 20-ton hopper cars from the Magor Car Corporation.

AID TO TAX DODGING

Secretary Mellon Tells How Agitators Against the Wealthy Fail in Objects

WASHINGTON, Dec. 16.—Emphasizing previous views, Secretary of the Treasury Mellon, in his annual report to Congress for the fiscal year ended June 30, 1924, in discussing taxation, declares that the question is not so much one of tax reduction as of tax reform. The attention of Congress is directed principally to what are termed the excessive surtax rates and the confiscatory estate rates. The Secretary also declares that the gift tax is unworkable and unduly hampers legitimate business and that the publicity provision in the revenue law is a mistake of policy and will be detrimental to the revenue.

Asserting that the power to tax has been well called the power to destroy, it is pointed out by the Secretary that it is necessary to adjust the tax policy to meet the facts, regardless of how pleasant a different policy may have seemed. Adverting to the argument that the wealthy should bear substantially the whole burden, the Secretary declares that it is quite obvious that collections could not be made solely from those having incomes in excess of \$300,000 a year, the \$861,000,000 personal income tax which was received from all classes in 1922, because the total income of the \$300,000 class, reported for taxation, was but \$365,000,000, and it is pointed out that even a 100 per cent tax would be ineffective to produce the revenue required.

The Secretary also explains that taxation in America is not a simple question of garnering a tithe of the product of a purely agricultural people. This is a nation of 48 States, it is declared, each with its own laws of property and corporate organization, none of which is subject to the Federal Government.

TAX EXEMPT SECURITIES

At this point the Secretary states: "We are notably ingenious in finding ways and means to accomplish our purposes. We are becoming experienced in investments outside the country, where the Federal tax collector's hand does not reach. We have the anomaly of a government seeking to collect income taxes and at the same time providing legally authorized means of avoiding payment of the tax by the issuance of fully tax-exempt securities through its own agencies and a refusal to tax the income from the enormous mass of securities being issued by State and municipal governments. It is an interesting commentary on the method of approach by some to an economic question that the means of tax avoidance by the wealthy was promoted by the very persons who most vehemently demand that the wealthy shall pay. Differing from the ideas of other countries, we have a theory of income tax which treats realized increment in capital values as income. The theory may be correct, but when we come to practice we find that, in order not to put all business and dealing in property in a strait-jacket, page after page of exceptions must be written into the law. With so many doors to the house, the effort to close them all has given us the most intricate tax law in history. At the apex of this structure, we have maximum rates of tax and a publicity provision which not only encourages tax avoidance but make its avoidance, unless human nature be changed, inevitable.

"Ways will always be found to avoid a tax so inherently excessive. America presents no exception in the history of taxation. The solution of the problem lies not in passing more laws but in adopting laws with more reason. A reasonable rate of tax will make elaborate, expensive methods of avoidance unprofitable. A reasonable rate of tax will make the administration of the tax laws more simple of accomplishment."

THE HIGH SURTAX

At some length the Secretary attacks the high surtax rate and urges a reduction. Among other things he points out that the inevitable result of uneconomic taxation is to raise the price level so that 97

per cent of the people in the country who pay no income tax directly make their payment indirectly in what they buy.

Declaring that the Treasury is concerned solely with recommending those rates which will produce and continue to produce the most revenue with the least disturbance, it is asserted that the problem in its essential features does not differ from the problem of any sales manager attempting to price the article he has to sell.

CINCINNATI MEETING OF MACHINE TOOL BUILDERS

At a regional meeting of the National Machine Tool Builders' Association, held at Cincinnati, Nov. 21, 22 individuals, representing 15 companies, attended. In respect to the outlook for business a considerable increase in inquiries was the general report. The thought was that the industry as a whole will get more business in 1925 than it got in 1924, but the more conservative figured that the 1925 business will not surpass 1923.

The possibilities of research on fundamental questions in connection with the cutting and forming of metals gave rise to the view that the association should cooperate with the committee of the American Society of Mechanical Engineers engaged on this work. The meeting voted to appoint a regional committee to take up this question among the membership in the region surrounding Cincinnati. E. A. Muller, King Machine Tool Co., Cincinnati, was appointed chairman.

CHICAGO IRON AND STEEL MARKET

(Concluded from page 1635)

forced advances in low phosphorus grades, while cast grades which have been dormant for some time are commencing to show life. Demand for iron mill grades is also sustained, although one user has embargoed further shipments pending the unloading of cars on track. The Wabash will receive bids on 5800 tons Dec. 19.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

	Per Gross Ton
Iron rails	\$19.50 to \$20.00
Cast iron car wheels	20.00 to 20.50
Relaying rails, 56 and 60 lb.....	26.00 to 27.00
Relaying rails, 65 lb. and heavier	27.00 to 32.00
Forged steel car wheels.....	22.50 to 23.00
Railroad tires, charging box size	22.50 to 22.00
Railroad leaf hair springs, cut apart..	22.50 to 23.00
Rails for rolling	20.00 to 20.50
Steel rails, less than 3 ft.....	20.50 to 21.00
Heavy melting steel	18.75 to 19.25
Frogs, switches and guards cut apart	19.00 to 19.50
Shoveling steel	18.50 to 19.00
Drop forge flashings.....	14.00 to 14.50
Hydraulic compressed sheets	16.00 to 16.50
Axle turnings	16.50 to 17.00
Steel angle bars.....	19.00 to 19.50
Steel knuckles and couplers	22.50 to 23.00
Coil springs	23.50 to 24.00
Low phos. punchings	20.00 to 20.50
Machine shop turnings	12.00 to 12.50
Cast borings	14.25 to 14.75
Short shoveling turnings	14.25 to 14.75
Railroad malleable	20.00 to 20.50
Agricultural malleable	19.50 to 20.00

	Per Net Ton
Iron angle and splice bars.....	20.00 to 20.50
Iron arch bars and transoms	21.50 to 22.00
Iron car axles	27.00 to 27.50
Steel car axles	20.50 to 21.00
No. 1 busheling	14.75 to 15.25
No. 2 busheling	10.75 to 11.25
Pipes and flues	18.50 to 14.00
No. 1 railroad wrought	16.50 to 17.00
No. 2 railroad wrought	16.75 to 17.25
No. 1 machinery cast	19.00 to 19.50
No. 1 railroad cast	17.50 to 18.00
No. 1 agricultural cast	17.50 to 18.00
Locomotive tires, smooth	18.25 to 18.75
Stove plate	16.00 to 16.50
Grate bars	15.50 to 16.00
Brake shoes	15.50 to 16.00

Prices of Finished Iron and Steel Products (Carload Lots)

Tank Plates

F.o.b. Pittsburgh mills, base, per lb.....	1.90c. to 2.10c.
F.o.b. Chicago, base, per lb.....	2.20c.

Structural Shapes

F.o.b. Pittsburgh mills, base, per lb.....	2.10c.
F.o.b. Chicago, base, per lb.....	2.20c.

Iron and Steel Bars

Soft steel bars f.o.b. P'gh mills, base, per lb.....	2.10c.
Soft steel bars f.o.b. Chicago, base, per lb.....	2.10c.
Reinforcing steel bars f.o.b. P'gh mills, base, per lb.....	2.10c.
Rails steel bars f.o.b. Chicago district mills, base, per lb.....	.2c.
Common iron bars delivered New York, base, per lb.....	2.34c.
Common iron bars f.o.b. Chicago, base, per lb.....	.2c.
Refined iron bars f.o.b. P'gh mills, base, per lb.....	2.90c. to 3.00c.
Common iron bars delivered Philadelphia, base, per lb.....	.232c.

Hot-Rolled Flats

(Pittsburgh)

Hoops, base, per lb.....	2.50c.
Bands, base, per lb.....	2.40c. to 2.50c.
Hoops and bands, narrower than 1-in., base per lb.....	.275c.
Strips, 10 in. and wider, base, per lb.....	.225c.
Strips, less than 10 in. wide to 3 in.....	.240c.
Strips, 3 in. wide and less, base, per lb.....	.250c.

Cold-Finished Steel

Screw stock and shafting, f.o.b. P'gh mills, base, per lb.....	2.80c.
Screw stock and shafting f.o.b. Chicago, base, per lb.....	2.80c.
Screw stock, Worcester mills, base, per lb.....	3.00c.
Screw stock, base, per lb., Cleveland.....	2.85c.
Shafting, ground, f.o.b. mill, base, per lb.....	3.20c.
Strips, f.o.b. P'gh mills, base, per lb.....	4.00c. to 4.15c.
Strips, f.o.b. Cleveland mills, base, per lb.....	4.15c.
Strips, f.o.b. Chicago mills, base, per lb.....	4.45c.
Strips, f.o.b. Worcester mills, base, per lb.....	4.30c.

Wire Products

(To jobbers in car lots f.o.b. Pittsburgh and Cleveland)

Nails, base, per keg.....	\$2.85
Bright plain wire, base, No. 9 gage, per 100 lb.....	2.60
Annealed fence wire, base, per 100 lb.....	2.75
Galvanized wire No. 9, base, per 100 lb.....	3.20
Galvanized barbed, base, per 100 lb.....	3.55
Galvanized staples, base, per keg.....	3.55
Painted barbed wire, base, per 100 lb.....	3.80
Polished staples, base, per keg.....	3.30
Cement coated nails, base, per count keg.....	2.25
*Bale ties, carloads to jobbers.....	75, 15 and 5 per cent off list
*Bale ties, carloads to retailers.....	75, 10 and 6 per cent off list
Woven wire fence, base, per net ton to retailers.....	67.00

Chicago district mill prices are \$2 per ton above the foregoing and Chicago delivered prices are \$3 per ton above the prices f.o.b. Cleveland and Pittsburgh. Birmingham mill prices \$3 a ton higher; Worcester Mass., mills \$3 a ton higher on products of that plant, and Duluth, Minn., mills \$2 a ton higher; Anderson, Ind., \$1 higher.

*F.o.b. Cleveland.

Sheets

Blue Annealed
(base) per lb.

Nos. 9 and 10, f.o.b. Pittsburgh dist. mill.....	2.70c.
No. 9 and 10 (base) per lb., f.o.b. Chicago dist. mills.....	2.80c.

Box Annealed, One Pass Cold Rolled

No. 28 (base) per lb., f.o.b. Pittsburgh dist. mills.....	3.50c. to 3.60c.
No. 28 (base) per lb., f.o.b. Chicago dist. mills.....	3.70c.

Galvanized

No. 28 (base) per lb., f.o.b. Pittsburgh dist. mill.....	4.75c.
No. 28 (base) per lb., f.o.b. Chicago dist. mill.....	4.85c.

Tin-Mill Black Plate

No. 28 (base) per lb., f.o.b. Pittsburgh dist. mill.....	3.50c. to 3.60c.
No. 28 (base) per lb., f.o.b. Chicago dist. mills.....	3.70c.

Automobile Body Sheets

No. 22 (base) per lb., f.o.b. mill.....	4.75c.
No. 28 (base) 8-lb. coating, per lb., f.o.b. mill.....	4.90c.

Long Ternes

No. 28 (base) 8-lb. coating, per lb., f.o.b. mill.....	4.90c.
No. 28 (base) 12-lb. coating, per lb., f.o.b. mill.....	5.10c.

Tin Plate

Standard cokes, per base box f.o.b. Pittsburgh district Mills	\$5.50
Standard cokes, per base box f.o.b. Chicago district mills	5.60
Standard cokes, per base box f.o.b. Elwood, Ind.....	5.60

Terne Plate

(F.o.b. Morgantown or Pittsburgh)

(Per Package, 20 x 28 in.)	
8-lb. coating, 100 lb. base	\$11.20
20-lb. coating I. C.	\$15.50
25-lb. coating I. C.	17.00
8-lb. coating I. C.	11.50
30-lb. coating I. C.	18.35
15-lb. coating I. C.	14.35
40-lb. coating I. C.	20.35

For Contents of This Issue See Orange Insert

Rivets

Large, f.o.b. P'gh and Cleveland mills, base, per 100 lb.	\$2.60
Large, f.o.b. Chicago mills, base, per 100 lb.....	2.75
Small, f.o.b. P'gh and Cleveland mills	70, 10 and 5 per cent off list
Small, f.o.b. Chicago mills.....	70, 10 and 5 to 70 and 10 off list

Rails and Track Equipment (F.o.b. mill)

Rails, standard, per gross ton.....	\$43.00
Rails, light, billet, base, per lb.....	1.80c. to 1.90c.
Rails, light rail steel, base, per lb.....	1.65c. to 1.75c.
Spikes, $\frac{1}{8}$ in. and larger, base, per 100 lb.....	\$2.90 to \$3.20
Spikes, $\frac{1}{8}$ in. and smaller, base, per 100 lb.....	3.00 to 3.50
Spikes, boat and barge, base, per 100 lb.....	3.25
Track bolts, all sizes, base, per 100 lb.....	3.80 to 4.25
Tie plates, per 100 lb.....	2.35 to 2.50
Angle bars, base, per 100 lb.....	2.75

Welded Pipe

(F.o.b. Pittsburgh district mills)

Steel		Iron	
Inches	Black	Galv.	Black
$\frac{3}{8}$	45	19 $\frac{1}{2}$	$\frac{1}{4}$ to $\frac{3}{8}$
$\frac{1}{4}$ to $\frac{3}{8}$	51	25 $\frac{1}{2}$	+11
$\frac{1}{2}$	56	42 $\frac{1}{2}$	22
$\frac{5}{8}$	60	48 $\frac{1}{2}$	11
1 to 3	62	50 $\frac{1}{2}$	13

Lap Weld

2	55	43 $\frac{1}{2}$	2	23	7
2 $\frac{1}{2}$ to 6	59	47 $\frac{1}{2}$	2 $\frac{1}{2}$	26	11
7 and 8	56	43 $\frac{1}{2}$	3 to 6	28	13
9 and 10	54	41 $\frac{1}{2}$	7 to 12	26	11
11 and 12	53	40 $\frac{1}{2}$	9 to 12	16	2

Butt Weld, extra strong, plain ends

$\frac{1}{2}$	41	24 $\frac{1}{2}$	2 to 3	61	50 $\frac{1}{2}$
$\frac{1}{4}$ to $\frac{3}{8}$	47	30 $\frac{1}{2}$	$\frac{1}{4}$ to $\frac{3}{8}$	+11	+54
$\frac{1}{2}$	53	42 $\frac{1}{2}$	$\frac{1}{2}$	21	7
$\frac{5}{8}$	58	47 $\frac{1}{2}$	$\frac{5}{8}$	28	12
1 to 1 $\frac{1}{2}$	60	49 $\frac{1}{2}$	1 to 1 $\frac{1}{2}$	30	14

Lap Weld, extra strong, plain ends

2	53	42	2	23	9
2 $\frac{1}{2}$ to 4	57	46 $\frac{1}{2}$	2 $\frac{1}{2}$ to 4	29	15
4 $\frac{1}{2}$ to 6	56	45 $\frac{1}{2}$	4 $\frac{1}{2}$ to 6	28	14
7 to 8	52	39 $\frac{1}{2}$	7 to 8	21	7
9 and 10	45	32 $\frac{1}{2}$	9 to 12	16	2
11 and 12	44	31 $\frac{1}{2}$			

To the large jobbing trade the above discounts are increased (on black by one point, with supplementary discount of 5 per cent and (on galvanized) by 1 $\frac{1}{2}$ points, with supplementary discount of 5 per cent.

Note—The above discounts on steel pipe also apply at Lorain and Youngstown, Ohio, and Wheeling, W. Va. Chicago district mills have a base 2 points less. Chicago delivered base 2 $\frac{1}{2}$ points less.

Boiler Tubes

(F.o.b. Pittsburgh)

Lap Welded Steel	Charcoal Iron
2 to 2 $\frac{1}{4}$ in.....	27
2 $\frac{1}{2}$ to 2 $\frac{3}{4}$ in.....	37
3 in.....	40
3 $\frac{1}{4}$ to 3 $\frac{3}{4}$ in.....	42 $\frac{1}{2}$
4 to 13 in.....	46

Beyond the above discounts, 5 fives extra are given on lap welded steel tubes and 2 tens on charcoal iron tubes.

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.....	55-58	3 and 3 $\frac{1}{4}$ in.....	36-39

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Prices of Iron and Steel Products and Raw Materials

Ores

Lake Superior Ores, Delivered Lower Lake Ports

Old range Bessemer, 55 per cent iron.	\$5.65
Old range non-Bessemer, 51½ per cent iron.	4.90
Mesabi Bessemer, 55 per cent iron.	5.40
Mesabi non-Bessemer, 51½ per cent iron.	4.75
<i>Foreign Ore, per Unit, c.i.f. Philadelphia or Baltimore</i>	
Iron ore, low phos., copper free, 55 to 58 per cent iron in dry Spanish or Algerian.	9.00c. to 9.50c.
Iron ore, Swedish, average 66 per cent iron	9.50c.
Manganese ore, washed, 51 per cent manganese, from the Caucasus, nominal.	42c.
Manganese ore, ordinary, 48 per cent manganese from the Caucasus.	40c.
Manganese ore, Brazilian or Indian, nominal	42c.
Tungsten ore, high grade, per unit, in 60 per cent concentrates.	\$8.75 to \$9.00
Chrome ore, basic, 48 per cent Cr ₂ O ₃ , crude, per ton, c.i.f., Atlantic seaboard.	18.50 to 24.00
Molybdenum ore, 85 per cent concentrates, per lb. of MoS ₂ , New York.	80c.

Coke and Coal

(Per Net Ton)

Furnace coke, f.o.b. Connellsburg prompt.	\$3.75 to \$4.50
Foundry coke, f.o.b. Connellsburg prompt.	4.50 to 5.00
Mine run steam coal, f.o.b. W. Pa. mines.	1.50 to 2.10
Mine run coking coal, f.o.b. W. Pa. mines.	1.90 to 2.10
Mine run gas coal, f.o.b. W. Pa. mines.	2.25
Steam slack, f.o.b. W. Pa. mines.	1.10 to 1.30
Gas slack, f.o.b. W. Pa. mines.	1.40 to 1.50

Ferroalloys

Ferromanganese, domestic, 80 per cent, furnace, or seaboard, per ton.	\$105.00
Ferromanganese, foreign, 80 per cent, f.o.b. Atlantic port, duty paid.	105.00
Ferrosilicon, 50 per cent, delivered.	75.00 to 82.50
Ferrosilicon, 75 per cent.	\$140.00 to 145.00
Ferrotungsten, per lb. contained metal.	89c. to 90c.
Ferrochromium, 4 per cent carbon and up, 60 to 70 per cent Cr., per lb. contained Cr. delivered.	11.50c.
Ferrovanadium, per lb. contained vanadium	\$3.50 to \$4.00
Ferrocobaltitium, 15 to 18 per cent, per net ton	200.00

Spiegeleisen, Bessemer Ferrosilicon and Silvery Iron

(Per gross ton furnace unless otherwise stated.)

Spiegeleisen, domestic, 19 to 21 per cent.	\$32.00 to \$34.00
Spiegeleisen, domestic, 16 to 19 per cent.	31.00 to 33.00
Ferrosilicon, Bessemer, 10 per cent, \$29.50; 11 per cent, \$42; 12 per cent, \$44.50; electric furnace ferrosilicon 10 to 11 per cent, \$38, furnace, with an advance of \$1 per unit for material above 10 per cent.	
Silvery iron, 5 per cent, \$27.00; 6 per cent, \$28.00; 7 per cent, \$29.00; 8 per cent, \$29.00 to \$30.00; 9 per cent, \$32.50; 10 per cent, \$34.50; 11 per cent, \$37.00; 12 per cent, \$39.50.	

Fluxes and Refractories

Fluorspar, 80 per cent and over calcium fluoride, not over 5 per cent silica, per net ton, f.o.b. Illinois and Kentucky mines.	\$17.50
Fluorspar, 85 per cent and over calcium fluoride, not over 5 per cent silica, per net ton f.o.b. Illinois and Kentucky mines.	18.00
Fluorspar, foreign, 85 per cent calcium fluoride, not over 5 per cent silica, c.i.f. Philadelphia, duty paid, per gross ton.	19.75
Per 1000 f.o.b. works:	
Fire Clay:	
Pennsylvania	High Duty \$40.00 to \$43.00
Maryland	45.00 to 47.00
Ohio	40.00 to 43.00
Kentucky	42.00 to 43.00
Illinois	42.00 to 45.00
Missouri	42.00 to 45.00
Ground fire clay, per net ton.	6.00 to 7.00

Silica Brick:

Pennsylvania	36.00
Chicago	45.00
Birmingham	50.00
Ground silica clay, per net ton.	8.00

Magnesite Brick:

Standard size, per net ton (f.o.b. Baltimore and Chester, Pa.)	65.00
Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.)	40.00

Chrome Brick:

Standard size, per net ton	45.00
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Bolts and Nuts

Machine bolts, small rolled threads... 60 and 10 per cent off list

Machine bolts, all sizes, cut threads 50, 10 and 10 per cent off list

Carriage bolts, smaller and shorter, rolled threads 50, 10 and 10 per cent off list

Carriage bolts, cut threads, all sizes... 50 and 10 per cent off list

Eagle carriage bolts... 65 and 10 per cent off list

Lag bolts... 60, 10 and 10 per cent off list

Plow bolts, Nos. 1, 2 and 3 heads... 50 and 10 per cent off list

Other style heads... 20 per cent extra

Machine bolts, c.p.c. and t. nuts, 5/8 x 4 in. 45, 10 and 5 per cent off list

Larger and longer sizes... 45, 10 and 5 per cent off list
Hot-pressed nuts, blank or tapped, square... 4c. off list

Hot-pressed nuts, blank or tapped, hexagons... 4.40c. off list

C.p.c. and t. square or hex. nuts, blank or tapped. 4.10c. off list

semi-finished hex. nuts:

1/2 in. and smaller, U. S. S. ... 80, 10 and 5 per cent off list

1/2 in. and larger, U. S. S. ... 75, 10 and 5 per cent off list

Small sizes, S. A. E. ... 80, 10, 10 and 5 per cent off list

S. A. E., 5/8 in. and larger... 75, 10, 10 and 5 per cent off list

Stove bolts in packages... 80 and 5 per cent off list

Stove bolts in bulk... 80 and 5 and 2 1/2 per cent off list

Tire bolts... 50, 10 and 5 per cent off list

Bolt ends with hot pressed nuts... 50, 10 and 5 per cent off list

Bolt ends with cold pressed nuts... 45, 10 and 5 per cent off list

Washers... 6c. to 6.25c. off list

Lock washers... 80 per cent off list

The foregoing are delivered prices for 1000 lb. or over, except on stove and tire bolts on which a full freight allowance is made on 300 lb. or over, for shipment within established zone limits, buyers outside of the zone paying the additional freight. Washers and lock washers are quoted f.o.b. Chicago and Pittsburgh.

Semi-Finished Castellated and Slotted Nuts

(Prices delivered within specified territories)

(To jobbers and consumers in large quantities)

Per 100 Net	Per 100 Net
S. A. E. U. S. S.	S. A. E. U. S. S.
1/4-in. ... 90.44	\$2.35
1/2-in. ... .515	3.60
5/8-in. ... .62	5.55
7/8-in. ... .79	8.90
1 1/8-in. ... 1.01	12.60
1 1/4-in. ... 1.05	13.10
1 1/2-in. ... 1.38	18.35
1 3/4-in. ... 1.70	21.00
2-in. ... 1.73	21.00

Larger sizes—Prices on application.

Cap and Set Screws

(Freight allowed within zone limits)

Milled cap screws...	80, 10 and 10 per cent off list
Milled standard set screws, case hardened	80, 10 and 10 per cent off list
Milled headless set screws, cut thread	80, 10 and 10 per cent off list
Upset hex. head cap screws, U. S. S. thread	80, 10, 10 and 10 per cent off list
Upset hex. head cap screws, S. A. E. thread	80, 10, 10 and 10 per cent off list
Milled studs ...	75 and 10 per cent off list

Semi-Finished Steel, f.o.b. Pittsburgh or Youngstown, per gross ton

Rolling billets, 4-in. and over...	\$36.00
Forging billets, ordinary carbons...	42.50
Sheet bars, Bessemer...	37.00 to 27.50
Sheet bars, open hearth	37.00 to 38.00
Slabs	36.00
Wire rods, common soft, base, No. 5 to 1/2-in.	48.00
Wire rods, common soft, coarser than 1/2-in.	\$2.50 over base
Wire rods, screw stock...	\$5.00 per ton over base
Wire rods, carbon 0.20 to 0.40...	3.00 per ton over base
Wire rods, carbon 0.41 to 0.55...	5.00 per ton over base
Wire rods, carbon 0.56 to 0.75...	7.50 per ton over base
Wire rods, carbon over 0.75...	10.00 per ton over base
Wire rods, acid...	15.00 per ton over base
Skelp, grooved, per lb.	2c.
Skelp, sheared, per lb.	2c.
Skelp, universal, per lb.	2c.

*Chicago mill base is \$50. Cleveland mill base, \$48.

Alloy Steel

(F.o.b. Pittsburgh or mill)

S. A. E. Series Numbers	Bars 100 lb.
2100* (1/2% Nickel, 10 to 20 per cent Carbon)...	\$3.00
2300 (3 1/2% Nickel) ...	4.75
2500 (5% Nickel) ...	\$6.25 to 6.50
3100 (Nickel Chromium) ...	3.65
2200 (Nickel Chromium) ...	5.50
3300 (Nickel Chromium) ...	7.50 to 7.75
3400 (Nickel Chromium) ...	6.50 to 6.75
5100 (Chromium Steel) ...	8.50
5200* (Chromium Steel) ...	7.50 to 8.00
6100 (Chromium Vanadium bars) ...	4.25
6100 (Chromium Vanadium spring steel) ...	4.25
9250 (Silicon Manganese spring steel) ...	3.50
Carbon Vanadium (0.45 to 0.55 Carbon, 0.15 Vanadium) ...	4c.
Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chromium, 0.15 Vanadium) ...	4.50
Chromium Molybdenum bars (0.80—1.10 Chromium, 0.25—0.40 Molybdenum) ...	4.25
Chromium Molybdenum bars (0.50—0.70 Chromium, 0.15—0.25 Molybdenum) ...	3.75
Chromium Molybdenum spring steel (1—1.25 Chromium, 0.30—0.50 Molybdenum) ...	4.75 to 5.00

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold drawn bars is 10 per lb. higher. For billets 4 x 4 to 10 x 10-in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4-in. down to and including 2 1/2-in. squares, the price is \$5 a gross ton above the 4 x 4 billet price.

*Not S.A.E. specifications, but numbered by manufacturers to conform to S.A.E. system.

NON-FERROUS METALS

The Week's Prices

Cents per Pound for Early Delivery

Dec.	Lake	Copper, New York		Tin		Lead		Zinc	
		Electro- lytic*		(Spot)		New	St.	New	St.
				York	York	Louis	York	Louis	
10.....	14.25	14.00	54.75	9.25	8.90	7.45	7.10		
11.....	14.25	14.00	54.75	9.37½	9.00	7.52½	7.17½		
12.....	14.37½	14.12½	55.25	9.50	9.12½	7.65	7.30		
13.....	14.37½	14.12½	...	9.50	9.12½	7.75	7.40		
15.....	14.50	14.25	55.37½	9.62½	9.25	7.87½	7.52½		
16.....	14.50	14.25	55.87½	9.62½	9.37½	7.90	7.55		

*Refinery quotation; delivered price ¼c. higher.

New York

NEW YORK, Dec. 16.

Higher prices feature all the markets. Heavy buying of copper has advanced quotations. Tin prices are higher but demand is light. The scarcity of lead is a feature at advancing quotations. Zinc has advanced nearly ½c. in the past week on excellent demand.

Copper.—Buying of copper has been on a large and liberal scale both for domestic and foreign consumption, and prices have advanced quite sharply. Total sales have reached many million pounds. Today most producers are asking 14.62½c., delivered, in the Connecticut Valley, but there is still some metal available at 14.50c. The market is in a very strong position and the 15c. level appears to be nearer than it did two weeks ago. Practically all sales are for first quarter delivery, with the majority calling for January-February shipment. Lake copper is quoted at 14.50c., delivered.

Tin.—The past week has been inactive and featureless. Total sales have been light, aggregating not more than 400 tons. Consumers are not interested and dealers are letting the market alone. Sellers also are not anxious to force the issue. Yesterday about 150 tons changed hands, but today the market has been inactive. Spot Straits tin today was quoted at 55.87½c., New York, due partly to higher prices in London where the advance today was £2 10s. per ton over yesterday, bringing spot standard to £261 5s., future standard to £264 10s., and spot Straits to £264 5s. The Singapore price yesterday was £264. These quotations are all about £5 per ton higher than a week ago. Arrivals thus far this month have been 1630 tons, with 8970 tons reported afloat.

Lead.—Rapid advances in quotations have been the feature of the week. The leading interest has advanced its contract price three times, on Dec. 10 from 8.65c. to 8.90c., on Dec. 11 to 9c. and yesterday to 9.25c., New York. The outside market has kept pace and today a fair average of the largely nominal quotations is 9.62½c., New York, and 9.37½c., St. Louis. Quotations in the West range from 9c. to 9.75c. and in the East from 9.25c. to 10c. It is generally conceded, however, that the metal is exceedingly scarce and that demand is far out of proportion to the supply. Actual transactions are few and far between.

Zinc.—Prime Western zinc is selling at the highest price of the year. Present and prospective demand for both domestic and foreign consumption is heavy and quotations for early delivery are 7.55c., St. Louis, or 7.90c., New York. One cause of the rapid advance in the last few days was the announcement last week of the American Zinc Institute's statistics for November, showing a large decrease in stocks and a small reserve supply.

Nickel.—Shot and ingot nickel are quoted unchanged in wholesale lots at 29c. to 30c. per lb., with electrolytic nickel at 33c.

Antimony.—The market is easier and Chinese metal is quoted at 14c. to 14.12½c., New York, duty paid.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted at 27c. to 28c., delivered.

Old Metals.—The market continues to advance and business is active. Dealers' selling prices are as follows in cents per lb.:

Copper, heavy and crucible	13.75
Copper, heavy and wire	13.00
Copper, light and bottoms	11.75
Heavy machine composition	10.50
Brass, heavy	9.00
Brass, light	7.75
No. 1 red brass or composition turnings	9.25
No. 1 yellow rod brass turnings	9.00
Lead, heavy	8.37½
Lead, tea	7.00
Zinc	4.25
Cast aluminum	17.50
Sheet aluminum	17.50

Chicago

DEC. 16.—Tin, lead and zinc have advanced on a strong market. Zinc is in heavy demand, generous export bookings having been added to expanding domestic business. Lead is exceedingly strong with buying heavy. Demand for copper is good with prices steady. Antimony is growing easier with larger supplies in sight. Among the old metals, grades of copper, brass, lead and zinc have advanced. We quote, in carload lots: Lake copper, 14.50c.; tin, 56.50c.; lead, 9.50c.; spelter, 7.50c.; in less than carload lots, antimony, 16c. On old metals we quote copper wire, crucible shapes and copper clips, 12c.; copper bottoms, 10c.; red brass, 9.25c.; yellow brass, 8c.; lead pipe, 7.50c.; zinc, 4.87½c.; pewter, No. 1, 26c.; tin foil, 36c.; block tin, 43c.; all buying prices for less than carload lots.

Freyn Engineering Co. Succeeds Freyn, Brassert & Co., Chicago

CHICAGO, Dec. 16.—H. A. Brassert, president H. A. Brassert, Inc., consulting engineer, Chicago, has sold his interests in Freyn, Brassert & Co., engineers, Chicago, to the latter company. He also has resigned as chairman of the board, but will continue to act as consultant for the company. The name of Freyn, Brassert & Co. will be changed to Freyn Engineering Co., effective Jan. 2. Mr. Brassert also recently sold his interest in the Miami Metals Co., Chicago. By relinquishing his financial interests in these organizations, Mr. Brassert and his associates, E. L. Ives and A. J. Boynton, can more advantageously devote themselves to consulting, reporting and the operation and management of properties. The style of H. A. Brassert, Inc., has been changed to H. A. Brassert & Co.

Detroit Scrap Advances

DETROIT, Dec. 16.—Producers of old material in the Detroit district are finding a ready market for their offerings and some advances have been registered during the past week, notably on compressed, which sold as high as \$15.75. The market generally has a very firm tone.

The following prices are quoted on a gross ton basis f.o.b. producers' yards, excepting stove plate, No. 1 machinery cast and automobile cast, which are quoted on a net ton basis:

Heavy melting steel	\$17.00 to \$17.50
Shoveling steel	16.50 to 17.00
Borings	14.00 to 14.50
Short turnings	14.00 to 14.50
Long turnings	13.50 to 14.00
No. 1 machinery cast	18.00 to 18.50
Automobile cast	18.50 to 19.50
Hydraulic compressed	15.50 to 16.00
Stove plate	15.00 to 16.00
No. 1 busheling	14.50 to 15.00
Sheet clippings	11.00 to 12.00
Flashings	12.50 to 13.50

For Contents of This Issue See Orange Insert

FABRICATED STEEL RECORD

Year in Bookings Likely 10 Per Cent Above 1923 —November Big Month

WASHINGTON, Dec. 16.—Sales of fabricated structural steel in November, reported to the Bureau of Census by 166 firms, totaled 204,741 tons, or 85 per cent of their monthly capacity of 239,880 tons. Sales in October, reported by 183 firms, amounted to 161,011 tons, or 66 per cent of their monthly capacity of 243,600 tons.

Computed bookings in November amounted to 221,000 tons against 171,600 tons in October. Shipments in November aggregated 166,400 tons, or 64 per cent of capacity against 202,800 tons, or 78 per cent of capacity in October.

The volume of November business is the largest for a month since March, 1923. The eleven months of this year show a total within about 30,000 tons of the total of 1923. With December awards less in tonnage than in November, the year's showing will be 10 per cent larger than 1923, which was a record at over 2,000,000 tons.

December Rate of Bookings Below November Rate—Business Buildings Conspicuous

The week's bookings in fabricated structural steel work exceed 28,000 tons in sizable projects as reported below, and so far, measured in terms of the notable awards, the rate of contracting in December is 10 to 15 per cent below that of November. This rate sustained will make December, as indicated elsewhere, a 200,000-ton month, and the year will cover 2,200,000 tons, or 10 per cent more than 1923, which was a record. Business buildings are conspicuous among the awards, and included also is 4000 tons of tank work. Of the 38,000 tons of fresh inquiries, over two-thirds may be classed as business buildings.

Prudential Life Insurance Co., Newark, N. J., office building, 6000 tons, to Lehigh Structural Steel Co.

Furniture Exchange, Lexington Avenue and Thirty-second Street, New York, building, 4000 tons, to Taylor-Fichter Steel Construction Co.

Dwight P. Robinson, Inc., New York, apartment building, Park Avenue and Sixty-fifth Street, 1400 tons to Easton Structural Steel Co.

Columbus Electric Light & Power Co., Columbus, Ala., penstocks, 400 tons, to Walsh & Weidner Boiler Co.

Sterlington Light & Power Co., Sterlington, La., power house, 350 tons, to Lukens Iron & Steel Co.

Virginian Railway Co., inspection shed at Mullens, W. Va., 200 tons, to Virginia Bridge & Iron Co.

Vermont Marble Co., Proctor, Vt., building, 600 tons, to G. Haarman & Co., Holyoke, Mass.

Apartment house, 209 West 106th Street, New York, 800 tons, to Taylor-Fichter Steel Construction Co.

Army and Navy Y. M. C. A. club house, Boston, 125 tons, to New England Structural Co.

Otis Elevator Co., office building, Boston, 150 tons, to American Bridge Co.

New York and Pennsylvania Co., Lock Haven, Pa., building, 400 tons, to Jones & Laughlin Steel Corporation.

Bovald & Seyfang Mfg. Co., Bradford, Pa., building, 250 tons, to Jones & Laughlin Steel Corporation.

Central Steel Co., Massillon, Ohio, power plant, bins and trestles, 1200 tons, to Moss Iron Works.

Continental Gin Co., Birmingham, factory building, 200 tons, general contract placed with the H. K. Ferguson Co.

Pan American Petroleum Co., Los Angeles, four 100,000-bbl. tanks, 1563 tons, to American Bridge Co.; four 55,000-bbl. and two 37,500-bbl. tanks, 1313 tons, to Western Pipe & Foundry Co., all for Watson, Cal.

Humble Oil Co., Wortham, Tex., four oil storage tanks, 1200 tons, to Chicago Bridge & Iron Works.

Olive & Ninth Realty Co., addition to Paul Brown Building, Ninth and Olive Streets, St. Louis, 1069 tons, to American Bridge Co.

Seattle, Wash., renewals for Twelfth Avenue South bridge, across Dearborn Street, 459 tons, to Wallace Equipment Co.

Jacksonville, Ill., hotel, 150 tons, to A. Bolters Sons Co.

Atlas Brewing Co., Chicago, addition, 125 tons, to Cerny, Pickas & Co.

Apartment house, 340 Prospect Avenue, Milwaukee, 210 tons, to Worden-Allen Co.

Maynard Electric Steel Casting Co., Milwaukee, pattern shop, 100 tons, to Wisconsin Bridge & Iron Co.

Dumbarton Point highway bridge, San Mateo County, Cal., 4000 tons, to Moore Dry Dock Co.

Loft building, Seventh Street, Los Angeles, 100 tons, to Llewellyn Iron Works.

Fitz apartments, Sacramento Street, San Francisco, 800 tons, to Central Iron Works.

Bamberger & Co., Newark, N. J., service station, 835 tons, to Shoemaker Bridge Co. for the Turner Construction Co.

Cleveland Electric Illuminating Co., substation, 600 tons, to American Bridge Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

Lynch Construction Co., New York, office and theater building, Philadelphia, 3000 tons.

Fred T. Ley & Co., New York, office building at John and Gold Streets, New York, 3000 tons; office building at Fifty-seventh Street and Madison Avenue, New York, 2000 tons.

Atlantic Coast Line, bridge, 300 tons.

Jamestown, N. Y., highway bridge, 950 tons.

Union Electric Light & Power Co., East St. Louis, Ill., third section of power plant, 2400 tons.

Museum of Fine Arts, Boston, extension, 180 tons.

Imperial Sugar Co., Sugarland, Tex., building, 800 tons.

Coal pulverizing plant, Providence, R. I., 470 tons.

Elliot apartments, Boston, 400 tons.

Statler Hotel, Boston, 8000 tons.

City of Indianapolis, garbage disposal plant, 100 tons, bids in.

Starks Building, Louisville, Ky., addition, 2000 tons, bids being taken.

Hibbard, Spencer, Bartlett & Co., Chicago, 14-story warehouse, estimated 5000 tons, plans to be issued soon, Graham, Anderson, Probst & White, architects.

Rock Island Lines, 1925 bridge, 1500 tons, instead of 1000 tons as reported last week.

South Chicago Savings Bank Building, South Chicago, 225 tons.

Sellwood Bridge, Portland, Ore., 408 tons, County Commissioners open bids Jan. 7.

Theater, Fruitvale Avenue, Oakland, 170 tons.

Santa Fe Railroad, San Bernardino, Cal., shop, 120 tons.

Euclid-Oliver Hotel, Cleveland, 1200 tons.

Detroit, theater and office building, 7000 tons.

Greenville Steel Car Co. Reorganized

The Greenville Steel Car Co., Greenville, Pa., the plant of which has been idle for the past two months, has been reorganized and preparations are under way for a resumption about Jan. 1. F. L. Fay, president of the company since its inception, becomes chairman of the board and F. D. Foote, secretary-treasurer of the old company, becomes president of the new company. K. C. Gardner, vice-president in charge of sales in the old organization, remains in that capacity under the change, and George H. Rowley, president of the Farmers & Merchants Trust Co., Greenville, becomes secretary. J. G. Dimmick, vice-president in charge of operations of the old company, is retiring, but will remain with the company for the present.

Youngstown Scrap Market

YOUNGSTOWN, Dec. 16.—There has been some buying of scrap by steel makers at the advanced levels of \$20.50 for heavy melting and \$19.50 for hydraulically compressed sheets, but in a moderate way. Melters still feel scrap prices are relatively too high as compared with pig iron, and prefer to increase the iron content in the mix under present conditions.

PERSONAL

Martin H. Schmid, metallurgical engineer of the United Alloy Steel Corporation, Canton Ohio, has been appointed assistant general manager of sales of the alloy division of the company, effective Dec. 1. He was graduated from Lehigh University in 1907 with the degree of mechanical engineer and for two years was engaged in power plant work. In 1909 he became associated as mechanical engineer with the United Alloy company, which was then known as the United Steel Co. In 1915 he organized the company's metallurgical department, of which he remained in charge until his recent promotion. He is a member of American Iron and Steel Institute, Iron and Steel Institute (British), American Society for Testing Materials, American Institute of Mining and Metallurgical Engineers, Society of Automotive Engineers and American Society for Steel Treating. He has been actively engaged on committee work in technical societies for a number of years and during the late war was on several Government committees in connection with steel specifications for aircraft materials and steel manufacturing.

William H. Bassett, technical superintendent and metallurgist, American Brass Co., Waterbury, Conn., has been awarded the James Douglas gold medal for 1925. This medal is awarded "for constructive research in copper and brass and other non-ferrous metals and their alloys and for contributions to the establishment of the present accepted high standards of quality," by the American Institute of Mining and Metallurgical Engineers. Born at New Bedford, Mass., March 7, 1868, Mr. Bassett was graduated in chemistry from the Massachusetts Institute of Technology in 1891. At one time he was chemist for the New Jersey Zinc Co., Newark, N. J., and in 1902 went to the Coe Brass branch at Torrington, Conn. In 1903 he became chief chemist and metallurgist. Since 1912 he has occupied his present position. Mr. Bassett has been the author of many technical papers and has been alluded to as the "pioneer metallurgist of the brass industry." He is a fellow of the American Association for the Advancement of Science and a member of the American Institute of Mining and Metallurgical Engineers, the Society of Automotive Engineers, the American Society for Testing Materials, the American Institute of Chemical Engineers, the American Chemical Society, the Institute of Metals (British), and the Society of Chemical Industry (British).

J. Kent Smith, Sheffield, England, whose research work in vanadium steel had much to do with its introduction and extensive use in the United States, particularly in automobile construction, has been in this country for a number of weeks. He returns to England this week with the expectation of closing his office at Sheffield and removing to the United States early in the new year to establish an office in New York.

R. W. Schultze was recently appointed assistant to W. C. Scott, Jr., sales manager for the Bethlehem Steel Corporation with offices in rooms 2020-2021 L. C. Smith Building, Seattle, Wash. Mr. Schultze was formerly connected with the Seattle office of Bethlehem Steel Corporation, but was removed to the San Francisco office. When the Midvale Steel Co. was taken over by the Bethlehem corporation, Mr. Schultze went



MARTIN H. SCHMID

with the Midvale company at San Francisco, and later was with the San Francisco office of the Youngstown Sheet & Tube Co., from which he resigned to locate again in Seattle.

C. S. Price, First National Bank Building, Hazleton, Pa., has been appointed district representative in northwestern Pennsylvania for the Conveyors Corporation of America, Chicago.

D. E. Sawyer, formerly of the Illinois Steel Co. and the Pollak Steel Co., has accepted a position with the Wanner Malleable Castings Co., Hammond, Ind., as vice-president, devoting most of his time to railroad sales.

Linwood D. Latta, secretary N. Jacobi Hardware Co., Wilmington, N. C., has been appointed secretary-treasurer of the Wayne Agricultural Works, Goldsboro, N. C.

Paul Willis, who has been placed in charge of the plants of the McClintic-Marshall Co. in the Chicago district as vice-president and manager, following the purchase by that company of the Morava Construction Co. and the Kenwood Bridge Co., Chicago, has been identified with the structural steel business for nearly 40 years. He was born at Orange, N. J., in 1864, and was graduated as a mechanical engineer from the Stevens Institute of Technology, Hoboken, N. J. His first business connection was in 1886 with the Wallis Iron Works, Jersey City, N. J., where he remained about a year. For three years he was associated with George S. Morrison, bridge and structural engineer, New York. In 1890 he went to Chicago and, in association with F. W. Barker, organized the Kenwood Bridge Co. and built its works. For 19 years he was secretary and engineer of that company and for the past 15 years has been president.

Edward W. Beadel, president Pennsylvania Engineering Works, New Castle, Pa., will sail on Dec. 20 for the Argentine on a special mission for the Bethlehem Steel Co. He will be gone for two years.

J. F. Kroske has been appointed manager of pneumatic tool sales for the Ingersoll-Rand Co. in the Pittsburgh territory, with headquarters at Pittsburgh.

E. L. Becker has been appointed by the Newport Rolling Mill Co., Newport, Ky., to direct advertising and sales promotion work which has been handled by Frank A. Moeschl, general sales manager. Hereafter these duties will fall to the new department, giving Mr. Moeschl time for other matters.

Alfred G. Norris has been appointed manager of the New England office of the Strom Ball Bearing Mfg. Co., with headquarters in Hartford, Conn.

George M. Verity, president American Rolling Mill Co., Middletown, Ohio, has been appointed to the directorate of the Cincinnati branch of the Federal Reserve Bank for a three-year term.

E. B. Rogers, formerly superintendent of the Samson Tractor Co., Janesville, Wis., has been appointed superintendent of the Midwest Forgings Co., Chicago Heights, Ill., succeeding R. C. Rowan, who resigned to engage in other business.

A. J. McFarland has resigned as general manager of the Steubenville Works, Wheeling Steel Corp., effective Jan. 1, and will be succeeded by E. N. McKelvey, at present assistant to the president of the company.

It is reported from Washington that the two new British battleships under construction are to carry nine 16-in. guns each, in three turrets, and that all guns will be forward, thus giving the ship no heavy gunfire at a pursuing enemy. The armor protection will be heavy and the speed of the ships moderate. The dimensions given are 702 ft. in length, 106 ft. in width and 30 ft. in draft of water.

WAGES ADVANCED

Frick Scale Adopted by Independent Coke Operators in the Connellsville District

PITTSBURGH, Dec. 16.—Notices have been posted by practically all of the independent Connellsville district coal and coke operators restoring wages to the H. C. Frick Coke Co. scale effective today at the plants of the larger coke producers and on Jan. 1 at the smaller operations. It will be recalled that last May and June the smaller operators reduced wages to the extent of about 30 per cent from the scale established Aug. 23, 1922, following the termination of the coal miners' strike of that year. As of July 1 this year, the larger producers made the reduction and this left only the H. C. Frick Coke Co., a subsidiary of the Steel Corporation, at the Aug. 1922 scale.

Increase in Activities

There has been a rapid expansion of the activities of the Frick Coke Co. since Election Day, and not having made the wage reduction it has had the call upon the labor supply of the district. Lately the business of the independent coke producers has grown sharply and with the Frick company still putting on capacity, it was feared that difficulty would be had in keeping the men from going from the independent ovens to the Frick plants. This is the basic reason for the wage increase. Another is that the supply of labor decreases from year to year, since the work has no strong appeal to newer generations in competition with other kinds of work. At some operations, the men took the wage cut on an understanding that it would be restored with better business and as that betterment now is here in iron, steel and coke, they have been quick to demand the restoration.

Probable Effect of Advance

The effect of the wage increase cannot be fully told at present. It does mean, however, that those who have contracts for first quarter tonnages of furnace coke will be called upon to pay anywhere from 60c. to \$1.15 per ton more than is specified in the contracts. Provision for a change in wages was written into the contracts and the amounts mentioned are the estimated increases in costs produced by the higher wages. Since there has been no betterment in the coal market, there are suggestions from the Connellsville district that

there may be separate wage scales for the strictly coal operations and for the coal and coke plants, but this meets the suggestion that this would mean cheaper coal for the by-product coke plants than the beehive ovens and would add to the competition of the latter. The common asking price here today on beehive furnace coke is \$4.50 per net ton at ovens, this representing the recent ruling price of \$3.75 plus 75c., an average of the expected increase in costs resulting from the wage advance, but at this writing that price is merely an asking price.

Pig iron to be produced after Jan. 1 goes up in cost to the extent of the increase in coke costs and the common expectation is that pig iron prices will be marked up, although such action will not be easy of accomplishment in view of the fact that practically all of the important melters of the district covered pretty fully against their first quarter requirements in November and for a time can afford to stay out of the market.

Brown & Sharpe Mfg. Co. Takes Optimistic View

The Brown & Sharpe Mfg. Co., Providence, R. I., machinery and tools, in a letter to the Boston News Bureau, says:

"We feel that the prospects for business are good. We see no indication of lower prices, in view of the prices being paid labor and prices that are being obtained for raw material. While there may be no decided upward trends, we see no indications of lower prices."

"Our industry is operating at about 40 per cent to 50 per cent of a fair normal operation, and stocks are plentiful. As indicated above, we believe there will be no tendency for lower wages in this industry, in view of the fact that if business picks up, as we hope it will, there will be a dearth of skilled employees. Customers are buying very conservatively; in fact, they are following closely a hand-to-mouth program."

"The machine tool industry as a whole has not yet recovered from the effect of the great surplus that was manufactured and put into operation during the war. Munitions factories and others demanded immense amounts of machinery, and when the break came in business these machines came upon the market. The industry is one that requires either new enterprises or expansions in old enterprises to furnish the market that is needed for its product."

OBITUARY

WILLIAM FARRIS, president Farris Bridge Co., Charleston, W. Va., died at his farm in Mineral County, W. Va., Dec. 12. He had been engaged in engineering and construction work for the past 25 years and some of the largest bridges in western Pennsylvania and West Virginia were erected under his direction. He was an alumnus of Northwestern University. He served as a member of the West Virginia legislature in 1924 and had been reelected for the coming year.

WALTER E. HARRINGTON, consulting engineer and inventor, died on Dec. 12 in New York, aged 58 years. He invented the I. T. E. automatic magnetic circuit breaker. Mr. Harrington was a member of the Engineers' Club, New York, and the Union League Club, Philadelphia.

GEORGE N. CHANDLER, president and active head of the Chisholm-Moore Mfg. Co., Cleveland, for the past 12 years, died suddenly on Dec. 12, aged 58 years. He was also a director of the Steel Improvement Co. and the Union Trust Co., Cleveland, and was actively in-

terested in other Cleveland companies. He was prominent in social and club activities and was a member of the Union Club and several other Cleveland clubs.

CLARENCE BURTON, head of the research department of the American Laundry Machinery Co., Cincinnati, died at his home in that city Dec. 6, after a short illness. Mr. Burton was a son of Robert M. Burton, president of the company, and was 26 years old.

JOHN K. MILLER, president Seattle Blower Co., Seattle, Wash., died at his residence in that city on Dec. 9, after a short illness. He was active in civic work and was a member of the Masonic fraternity. He is survived by his widow and four sons.

SAMUEL JAMES McCRUDDEN, for 31 years superintendent of the Peck Rolling Mills, Ltd., Montreal, Canada, died of heart trouble on Dec. 13 at his home, 5764 Park Avenue, that city, at the age of 62 years. Mr. McCrudden is survived by one son, F. R. McCrudden, of Moorestown, N. J.

Losses sustained by the Chicago Pneumatic Tool Co., 172 High Street, Boston, last week due to fire, were not serious enough to interrupt business.

WOULD MODIFY LAW

Secretary of Labor Proposes More Liberal Provision as to Immigrants

WASHINGTON, Dec. 16.—Recommendation is made by Secretary of Labor Davis in his annual report that a division of labor safety be created in the Bureau of Labor Statistics. Such a division, it is stated, would bring into uniformity State legislation along accident prevention lines and uniformity in the gathering and compilation of accident statistics, so that the Secretary of Labor will eventually be able to bring these together on a national scale and show the actual number of accidents, and be able to compute accident rates in all the principal industries.

The Secretary also recommends a comprehensive study of the apprenticeship systems and present apprenticeship situation from a thoroughly impartial point of view in all the principal industries. Perhaps upon no single subject, he says, with the exception of wages and cost of living, has the department been more importuned for definite and up-to-date information than upon the subject of apprenticeship.

The Secretary again recommends early codification of all laws dealing with immigration. Among modifications to the present 2 per cent quota act which he recommends is a provision for the admission, regardless of quota, of farmers and skilled or unskilled labor where labor of like kind cannot be found unemployed in the United States, provided that no strike or lockout exists or impends in the industry seeking to import such labor.

"There can be no doubt that there are times in our economic history when we seek man power," says the Secretary. "Our immigration history has proved that it is folly to seek to satisfy this need by throwing down all the bars and admitting aliens indiscriminately. The proposal should be safeguarded by provisions for full and ample hearing and investigation by the Secretary of Labor into the conditions under which it is sought to bring labor into the country." In this connection, however, the Secretary also recommends that authority be vested in the President by proclamation to suspend immigration from time to time whenever the Secretary of Labor and Secretary of Commerce shall jointly certify that in their opinion unemployment in this country makes such suspension necessary. The Secretary urges that preference within the quota should be given families of alien residents in the United States, immigrants who served the United States military forces in the World War, skilled laborers, and all other laborers, including domestic servants.

Keeping Track of Strikes

The Secretary also recommends that the strike-reporting work be strengthened and enlarged with a view to not only keeping track of strikes from the sources now used but that comprehensive reports should be made on important strikes.

"To a certain extent," says the Secretary, "this was the former policy of the department, but it has been abandoned because of lack of personnel equipped to do the work and lack of funds."

During the fiscal year ending June 30, 1924, a total of 706,896 immigrant aliens were admitted to the United States, compared with 522,919 in the preceding fiscal year and 309,556 in the year ending June 30, 1922, this being the three-year period during which the so-called quota limit act of May 19, 1921, was in force, according to the report of the Commissioner General of Immigration. In addition to the 706,896 immigrant aliens who entered during the fiscal year ended June 30, 1924, it is stated that 172,406 non-immigrant aliens were also admitted, making a total of 879,302 for both classes. As a partial offset to this number, 76,789 emigrant aliens and 139,956 non-emigrant aliens departed from the country, the net increase in the alien population being 662,557. The principal racial stocks represented in this immigration for the fiscal year re-

cently ended were shown to be English, German, Scotch, Scandinavian, Polish, African, Italian, Mexican and Hebrew.

Three Important Factors

The great, perhaps almost startling, increase in immigration during the past two years, the Commissioner General says, might very naturally suggest a substantial breaking down of the per centum limit law, but such is not the fact. What happened, he says, was almost entirely due to three important factors that might have been discerned at the time the law was enacted. Taking up these factors it is first pointed out that the quota limit provision was applicable only to Europe, Africa, Australasia, and that part of Asia commonly known as the Near East. It did not seek to limit immigration from Canada, Mexico and other parts of the New World. Secondly, it is stated, the quotas allotted to the British Isles, Germany and other countries of Northwestern Europe were greater, and in some instances, very much greater, than the normal immigration from those countries. Finally, it is stated, the quota limit law, like all preceding immigration legislation, contained a good many exceptions under which applicants could be admitted in excess of allotted quotas, and during the past fiscal year such admissions were also considerably increased by reason of court decisions which, until reversed by the Supreme Court late in the year, materially liberalized the terms of the law.

INCREASING PRODUCTION

Unusual Activity of Youngstown Steel Companies for This Time of the Year

YOUNGSTOWN, Dec. 16.—Instead of slowing down production, as usual at this season because of approaching inventory taking, steel companies in this district are accelerating output. Independents generally report that new business is in excess of shipments, and predict near capacity production during the first quarter of 1925, at a satisfactory price level.

This week 45 of 52 independent open-hearth furnaces are melting, comparing with 43 active the preceding week, while 107 sheet mills are under power, the best record in more than a year.

The Youngstown Sheet & Tube Co. is operating 20 of 24 open-hearth furnaces in this area. Independent merchant bar mill capacity is active at close to capacity.

Within a short time, the Sheet & Tube company will blow in its second blast furnace in the Hubbard group, and Jeannette stack at the Brier Hill works. Its new blast furnace at Indiana Harbor will not get under way until next spring, when it is scheduled for completion. Expansion in iron demand is expected to bring resumption of other stacks in the near future.

Price concessions have virtually disappeared in the sheet market, as business has come to the mills recently in such volume that it is no longer necessary for makers to cut below established levels. Capacity sheet mill operations are likely in the near future. The volume of business now on makers' books is sufficient for about three months' production at the current rate.

The November payroll of \$6,205,318 by Youngstown industries is slightly below that of October. During the first 11 months this year, the city's industries distributed nearly \$70,000,000 in wages.

One of the problems confronting the industry is a possible shortage of common labor next year. Importation of laborers from Mexico is suggested by district mill managers as one possible source of supply, as the mills can no longer look to European immigration to recruit common labor, and barriers erected by the Southern States against negro migration to the North have effectively reduced the common labor supply from the South. Steel makers are hoping the immigration laws will be somewhat modified, so as to permit a larger influx of immigrants into this country from Central Europe.

NEW TRADE PUBLICATIONS

Coal Gas Plants.—The Koppers Co., Union Trust Building, Pittsburgh, has issued a 40-page brochure on its coal gas plants, which reviews the history of such installations, a number of which are described and illustrated.

Furnace Equipment.—Combustion Engineering Corporation, Broad Street, New York. A five-page reprint, taken from a condensed catalogue of mechanical equipment, which describes and illustrates the major products of the company.

Conveyors.—Conveyors Corporation of America, 326 West Madison Street, Chicago. Bulletin describing and illustrating the operation of the American high duty conveyors under severe conditions. Size, 8 pages, 8 x 10 in.

Lift-Truck Platforms.—Lewis Shepard Platform Corporation, 563 East First Street, Boston 27. Booklet showing the construction and adaptability of hard wood lift truck platforms. Size 4 pages, 8 x 10 in.

Grindstones.—The Cleveland Stone Co., Cleveland. Catalogue No. 11 of 62 pages, 6 x 10 in., describing with illustrations the construction and use of a wide variety of grindstones. Tables of weights are given and one section is devoted to fixtures.

Forging Ingots.—Mesta Machine Co., Pittsburgh. Four-page bulletin devoted to fluted or special types of open-hearth steel ingots cast with hot tops in sizes from 17 to 56 in. diameter and weighing from 6000 to 100,000 lb. These are furnished not only in plain carbon steel but in nickel steel, chrome steel, vanadium steel and molybdenum steel as well as in the compounds, chrome-nickel, chrome-vanadium and chrome-molybdenum steels.

Una-Flow Engines.—Mesta Machine Co., Pittsburgh. Four-page folder of engines built under Stumpf patents. These are offered in competition with electric drive, as prime movers to replace old engines of low efficiency.

Gear Drives.—Mesta Machine Co., Pittsburgh. Twenty-four-page bulletin B devoted to Mesta gear drives, mostly of the herringbone or similar pattern. A few straight tooth mill pinions and bevel gear sets are included. Gears are shown from 150 hp. to 4000 hp. capacity, connected up with various types of rolling mill and other machinery, including both hot mills and cold mills.

Mica Insulation.—Chicago Mica Co., Valparaiso, Ind. A 23-page booklet describing "Micabound, the Modern Mica" and the various uses to which it can be put.

Recent Installations.—C. O. Bartlett & Snow Co., Cleveland. Bulletin 52, consisting of a large number of photographs of mechanical sand handling equipment, carrying equipment and continuous molding equipment. The whole idea back of the installation of such equipment is a combination of labor saving with reduced labor cost and time saving with reduced overhead cost. The photographs covered were taken at eight representative plants.

Precision Cold Mills.—Blake & Johnson Co., Waterbury, Conn. Two-page folder devoted to cold mills of the double reduction type, made in four sizes with roll diameters of 8½ to 14½ in., and driven by motor mounted on the same frame. Cut steel herringbone gears are used.

Rust Prevention.—American Rust Proof Co., 8 West Fortieth Street, New York. A 16-page pamphlet entitled Rust and Rust Prevention, describing "Vatu," a compound in which metals may be dipped.

Rotary Displacement Meter.—Connersville Blower Co., Connersville, Ind. Bulletin 4-B, four pages. Describes the company's improved rotary displacement meter, an outstanding improvement in which is the method of mounting the bearings, which are in an accessible chamber at the ends of the impeller shafts. Tables of capacities and dimensions are given, and also a partial list of installations.

Drawing Tables and Filing Cases.—Economy Drawing Table and Manufacturing Co., Adrian, Mich. Catalog O. Several types of drawing tables, sectional filing cases and blue print cabinets, and the company's U-Planfile, in which individual cloth or tissue tracings or sketches are held flat in a vertical position, are described and illustrated.

Thrust Bearings for Hydroelectric Generating Units.—Kingsbury Machine Works, Philadelphia. Bulletin E. Describes vertical adjustable thrust bearings for hydro-

electric units. Rated thrust capacities and dimension lists are given, as well as mounting designs and data on water cooling equipment. A list of notable installations, including that of the Niagara Falls Power Co., is included.

Welding Electrodes.—General Electric Co., Schenectady. Booklet No. Y-2019, 12 pages describing the new type A welding electrode. Details are given on the characteristics, and the results of tests on welded cast iron specimens and deposited metal specimens are described. Oscillograms demonstrating arc stability are reproduced.

Steel Window Operators.—Truscon Steel Co., Youngstown, Ohio. Catalog, 64 pages. Treating the subject of mechanical control of steel windows for regulating natural ventilation and lighting through walls and roofs. Operators for various types of windows are described. These include motor driven and tension rack and pinion operators, and adjustable connecting arms for center pivoted sash in side walls and vertical faced monitors; hand power, motor driven and heavy duty tension type operators for long and short runs of continuous sash, principally in roofs, toggle type operators for use in limited space and lever arms for operating continuous sash; duplex or two-way motor driven operators for long run continuous sash, the motor driven operator being centrally located for controlling the sash in either direction. Numerous illustrations of various types of operators and of buildings equipped with them as well as construction details, specifications and other information are given.

Tests of Steam Generating Unit.—Heine Boiler Co., St. Louis. 24-page pamphlet, consisting of a reprint from the Sept. 16 issue of *Power*, detailing the tests of a Heine boiler at a municipal power plant. Illustrations include a considerable number of diagrams showing the performance of the boiler during the test.

Refractory Arches.—M. H. Detrick Co., 740 South Dearborn Street, Chicago. 52-page catalog showing boiler arches of various designs for different types of boilers and for use over various kinds of automatic stokers. There is a profusion of illustration, with sufficient text to cover explanatory requirements. The individual brick of which the arches are made are designed for suspension from supporting members.

Welding and Cutting.—Bastian-Blessing Co., Chicago. Small 36-page pamphlet on "Rego" welding and cutting equipment of all kinds. It is designated as catalog No. 32 and is fully illustrated.

Steel.—Cumberland Steel Co., Cumberland, Md. A 27-page pamphlet giving a description of and prices for turned and ground steel from sizes 1½ in. to 8 in.

Turret Lathes.—Warner & Swasey Co., Cleveland. Booklet of 12 pages describing the company's No. 4 universal turret lathe with 12 speed geared head and motor drive, the features of which were outlined in THE IRON AGE of Dec. 4.

Centrifugal Pumps.—Earle Gear & Machine Co., Wayne Junction, Philadelphia. Centrifugal pumps in a variety of types and drives are described in a 30 page booklet. The illustrations include actual installations and sectional views. A section is devoted to useful information.

Price List of Repair Parts for Watthour Meters.—Sangamo Electric Co., Springfield, Ill. Parts List No. 9, 24 pages. Prices of various parts of type H watthour meters, single-phase and polyphase, are given. The various parts are illustrated.

Steam Engines.—Fitchburg Steam Engine Co., Fitchburg, Mass. Descriptive catalog of 40 pages. Valves, cylinders, beds or frames and other details are described. Various types of engines and installations are illustrated.

Tacks.—Tower Mfg. Co., Madison, Ind. Illustrated catalog of 37 pages showing a variety of tacks, cobblers' nails, staples and belt and hame rivets. The booklet is indexed in several languages.

Radial Drills.—Western Machine Tool Works, Holland, Mich. Catalog No. 25, 36 pages, 8½ x 11 in. Devoted to the company's plain and universal radials with low-hung drive. Features of construction are described and among the numerous illustrations are many attractive white on blue line sketches. Full page illustrations of the plain type radial, the heavy type, the manufacturing, header and universal types are on buff, blue and backgrounds of other colors. Specifications of all types of machines are given.

Enamelled Resistor Units.—General Electric Co., Schenectady. Bulletin No. 48941A, 18 pages. Uses and advantages of these units are outlined and standard ratings and dimensions given. The booklet is well illustrated.

A. M. Castle & Co., Chicago, Acquire Company at Los Angeles, Cal.

SAN FRANCISCO, Dec. 6.—(By Air Mail.)—Little & Robertson Co., steel fabricator and distributor, Los Angeles, Cal., has been taken over by A. M. Castle & Co., Chicago, in a merger calling for an initial expenditure of \$500,000, which will be doubled in the immediate future. The merger was completed in Los Angeles by W. B. Simpson, president, and Louis M. Henoch, treasurer, of A. M. Castle & Co.

The Little & Robertson Co. plant is at Thirty-seventh and Alameda Streets, Los Angeles, and comprises a frontage of 540 ft. on Thirty-seventh Street, and 135 ft. on Alameda Street. The ground area will be doubled in the near future.

By this merger A. M. Castle & Co. will have warehouses in Seattle, San Francisco and Los Angeles. President Simpson, in a statement at Los Angeles, following the consummation of the merger, said:

"We are going after the steel business in every important port of the Pacific. We see great possibilities, not only in North, Central and South America, but in the Orient as well. The Los Angeles plant will become a leading distributing center for all of our structural steel plates, bars, sheets, tubes, rivets, nuts, bolts and practically all rough steel products. The local plant is fabricating a wonderful output. This will be more than doubled in the near future."

In commenting on the arbitrary freight rates affecting Los Angeles shippers, Louis M. Henoch, treasurer A. M. Castle & Co., said: "The one thing that seems to militate against the economic interest of Los Angeles is the matter of freight rates, or arbitrary charges, from the Los Angeles port proper to inland sections. Instead of hooking up the entire country as an industrial district, similar to the industrial districts that are around all of the Atlantic ports, as well as San Francisco and Seattle, and moving freight under a switching charge, an arbitrary freight rate acts as an embargo on all incoming and outgoing products.

"As far as I have gone into the matter, it would seem that Los Angeles is compelled to pay on steel products a differential of \$1 each way, a condition that does not obtain on the Atlantic Coast nor at the ports of San Francisco and Seattle. But I have no doubt that the keen foresight of the proper authorities will adjust such a condition in the interests of all concerned."

Trade Changes

The Cleveland office of the Sullivan Machinery Co., Ralph T. Stone, district manager, now is at Room 701, Rockefeller Building.

The E. J. Manville Machine Co., Waterbury, Conn., has opened a western office at 1209 Swetland Building, Cleveland.

Ruve Brothers, Inc., 765-69 Atlantic Avenue, Brooklyn, dealer in heavy hardware, contractors' and automobile supplies, has decided to liquidate the business at the end of this month and to go out of business.

The Cleveland Worm & Gear Co., has moved from East Fortieth Street, to 3249-99 East Eightieth Street, Cleveland. The company manufactures worm reduction gears exclusively, and the new plant, which is double the capacity of the former, is laid out especially for such work.

Dwight P. Robinson & Co., Inc., has consolidated its substation and transmission line offices, which have been located at 1300 Penn Avenue and 119 Federal Street, Pittsburgh, and the combined offices now are located at 3722 Fifth Avenue, Pittsburgh, with W. K. Murray in charge.

The San Francisco office of A. M. Castle & Co. has been moved to Seventeenth and Mississippi Streets, to the building formerly used as a warehouse by the Berger & Carter Co., 400 Mission Street. A few months ago A. M. Castle & Co. absorbed the Berger & Carter Co. and has now closed the former Mission Street office.

The N. C. Fallor Co., 30 Church Street, New York, and G. A. Pabst, 106 South Jefferson Street, Chicago, have been appointed direct sales representatives in their respective territories for the Stockbridge Machine Co., maker of crank shapers, Worcester, Mass.

The U. S. Metallic Packing Co., Philadelphia, has taken over the entire business of the Locomotive Lubricator Co., Chicago, manufacturer of the Schlacks system of force feed lubrication. W. J. Schlacks, C. W. Rudolph and O. H. Neal, formerly of the Locomotive Lubricator Co., have become affiliated with the Metallic Packing Company.

The Great Lakes Distributing Co., Detroit, miner and shipper of molding, core and blast sands, has changed its name to the Great Lakes Foundry Sand Co. No change in ownership, management or policies has been made.

George S. Seltzer, New England representative of the Pittsburgh Valve, Foundry & Construction Co., has leased offices in the Unity Building, 185 Devonshire Street, Boston.

The Conveyors Corporation of America, 226 West Madison Street, Chicago, has appointed Frederick E. Bausch, 1105 Chemical Building, St. Louis, as district representative in eastern Missouri and southern Illinois.

The Page Belting Co., 60 Pearl Street, Boston, maker of leather belting, has moved to 120 High Street.

Joseph K. Barber, 170 Oliver Street, Boston, dealer in machine tools, has removed to 5 and 7 Wadley Place, South Boston.

Industrial Items

Practically all the box netting manufacturing equipment of the Wickwire Spencer Steel Corporation's Hammond Street, Worcester, Mass., plant has been moved to the Clinton plant, where mechanics are setting up the equipment. The move is made with a view to the consolidation of departments.

Little & Robertson, Inc., has completed a consolidation with A. M. Castle & Co., under whose name the future business will be conducted with increased capacity and added facilities. The officers of Little & Robertson will be the officers of the new organization.

Plant of the Central Metal Products Corporation at College Point, L. I., for the manufacture of steel partitions, doors and trim, including all machinery, tools and equipment, will be sold on the premises to the highest bidder on Dec. 15 at 11 a. m. Hugh Govern, Jr., 120 Broadway, New York, has charge.

The Franklin Railway Supply Co., 17 East Forty-second Street, New York, has resumed operations at its Baltimore works, starting at about 70 per cent of capacity.

The Wyoming Valley Coal Co. has purchased property owned by the Edward Balf Construction Co., Hartford, Conn. The property, trestle and pocket were formerly owned and operated by the O'Connor Coal & Supply Co. and now are operated by the Wilson Fuel Co. Extensive improvements will be made and 10 large oil storage tanks will be installed.

The Dodge-Haley Co., 218 High Street, Boston, dealer in iron and steel, has moved into its new warehouse at 14-24 Hurley Street, East Cambridge, Mass. The new plant is one and two-story, 200 x 100 ft., and runs through to Clark St. The management plans to take on additional lines, including fine tools. Mrs. L. G. S. Marvin is president; her son, Dr. Frank L. Marvin, treasurer; and Charles L. Fellows, vice-president and general manager. Charles A. Haines, who was an officer and substantial owner in the company, has disposed of his holdings. He is retained as purchasing agent. Mr. Haines is president of the New England Iron and Hardware Association.

Continuous Electric Core Oven

A continuous electric oven installed on the second floor of the core-making department of the Ferro Machine & Foundry Co., Cleveland, is described in a four-page leaflet distributed by the F. A. Coleman Co., Cleveland, which designed and installed the oven.

The Ferro company has a capacity of 350 tons of gray iron per day, which goes into automobile castings. The core department operates 24 hr. a day when working at capacity, and the making, baking and finishing of cores involves a large movement of material.

Cores after being cleaned, pasted and blackened must be dried before going into the foundry. The operation of blacking, assembling and pasting takes place along lines of gravity roller conveyors. The completed cores are placed on plates which are pushed along the conveyors, running into a common roller conveyor entering one end of the continuous electric oven. The assembled cores are dried as they pass through the oven, from which they are routed along a roller conveyor to be packed on skids and shot down a roller coaster slide to the foundry floor below. High-speed operation and practically no handling for the baking operation are features of the installation.

The oven, which is 26 ft. long, 7 ft. wide and 7 ft. high, may be moved wherever building conditions will permit. The outer walls are 9 in. thick and are of Nonpareil insulation brick, constructed on a heavy steel framework. The weight of the oven, without cores and plates, is 35,000 lb. The electrical equipment, of Westinghouse design, consists of several 5 kw. heaters, a door switch used as a safety device, a push button station for controlling the power supply to the oven, and a motor-operated snap switch single-section control panel which is mounted on the outside of the oven. Automatic temperature control is provided. The operating temperature is 450 deg. Fahr., and the drying time of the cores is about 5 min. A fan is provided to circulate the heated air. Insulated doors at each end are adjustable to various heights to provide the smallest openings possible for the cores to pass through.

Plans of New Companies

The United States Wire Die Corporation, 233 Broadway, New York, recently incorporated with \$60,000 capital stock, will manufacture wire drawing dies. The company purchases from time to time standard types of machine tools and special machinery. Diamond dies of all sizes will be manufactured. Thomas G. O'Brien is president.

The Horne & Ebling Corporation, 50 Church Street, New York, has been organized with \$20,000 capital stock to act as dealer in railroad and marine equipment. J. N. Ebling and L. W. Horne are the principals.

The Keiner Metal Forging Co., New York, incorporated with 250 shares of stock, no par value, will engage in manufacturing forgings and like products. It has purchased a plant site but final decision as to how operations will be started has not yet been made. Temporary address is in care of W. J. Carlin, 2 Rector Street.

C. D. Watson, R. F. Thompson and others have incorporated the Watson Brothers Steel Co. at Youngstown, Ohio, with authorized capital of \$75,000. The company plans to take over the sheet jobbing business heretofore operated by these interests as a partnership.

W. Horace Williams Co., Inc., 816 Howard Avenue, New Orleans, has been organized by an experienced personnel as engineer and general contractor. It has a large modern plant and equipment, and will specialize in the construction of docks, dams, bridges, railroads and industrial plants. W. Horace Williams is president and general manager.

The Lawson Auto Parts Co., Inc., 307 South Twentieth Street, Birmingham, Ala., has been organized as manufacturers' representatives, handling pistons, piston rings, roller bearings, bushings, etc. Matt Lawson is president and treasurer, and Nelson P. Hury is secretary.

R. F. Haffenreffer, Jr., of Bristol, R. I., has purchased the greater part of the Herreshoff Mfg. Co.'s plant at Bristol and intends to continue operations along the same lines in the building and repairing of boats. Associated with him are N. G. Herreshoff, consulting engineer, and Sidney Herreshoff, in charge of the design department.

The Cook Spring Co., Ann Arbor, Mich., has been organized to take over the property and assets of the Cook Spring Co., a New York corporation. There will be no change in management or scope of operations. A. J. Donally is one of the heads.

Irvin V. Amerman has opened an office for the sale of iron and steel railroad supplies, and new and relaying rails at 408 Frisco Building, St. Louis. Mr. Amerman was connected with the David J. Joseph Co. of Cincinnati and its predecessors for 21 years, 16 as manager of their St. Louis office and the last two years as assistant to the president at Cincinnati.

The Adirondack Steel Foundries Corporation, Watervliet, N. Y., has been incorporated with \$525,000 capital stock to take over the business of the company by that name, manufacturing iron and steel castings. The new officers are Clifton W. Sherman, Hamilton, Ontario, president; F. W. Sherman, vice-president and general manager; and C. A. Davis, secretary-treasurer. Operations are now going forward on a considerably enlarged scale.

The Bock Auto Parts Co., 932 Eighth Avenue, New York, organized with stock and assets totaling \$25,000, will act as distributor for manufacturers of pistons, bolts and automotive replacement parts. M. M. Schuman is one of the heads.

Bell-Knot, Inc., 69 Park Place, New York, has been incorporated with \$20,000 capital stock to deal in iron and steel products. Its business will consist principally of handling seconds in a wide variety of products. Frederick E. Bell is managing head.

The Public Service Weighing & Vending Machine Co., 245 Grand Street, New York, recently organized with \$40,000 capital stock, will continue a business in the manufacture of various kinds of machines as indicated. All manufacturing will be done by contract and general offices will be maintained at the above address. Samuel Davidson, secretary-treasurer, states that the business is being continually enlarged.

The American Engineering Co., Philadelphia, builder of Jurick refrigerating machines, announces the appointment of Edward Flowers of Huntington, W. Va., as sales agent for the Huntington territory. The new company will be known as the Huntington-Jurick Refrigerating Co. and will engage in general refrigerating, contracting and service work.

The Lawrence Products Co., Legal Street and Pennsylvania Railroad, Newark, N. J., recently incorporated with \$100,000 capital stock, plans to manufacture and deal in lead and lead products. Work has just been completed on a plant at Waverly, N. J. and operations have been started on a small scale. The company is in the market for any tonnage of battery lead plates, scrap lead and cable lead. M. E. Zuckerman is vice-president.

The Victory Products Mfg. Co., Inc., 136 West Fifty-second Street, New York, has been organized to manufacture radio sets complete. Operations have been started and the company is in the market for the various materials required.

The Service Tool Co., 461 New Jersey Railroad Avenue, Newark, N. J., has been purchased by William S. Jones and E. L. Moberg, and a new company is being formed to operate the business. Machinery and equipment will be moved from the Newark plant to Latrobe, Pa., where the new company will operate. Capitalization of the new organization will be about \$200,000 and operations will be confined to making "Shearkleen" files, used principally by automobile body manufacturers. J. B. Moore is president and general manager.

The Eastern Instrument Co., 109 Oliver Street, Newark, N. J., has been incorporated to manufacture various scientific measuring instruments, air testers, etc. It has a plant at the above address and will start operations on air testers. Later several other instruments will be added to the line. Paul L. Tyson is general manager.

The United Iron & Metal Co., New Haven, Conn., organized with \$25,000 capital stock, will act as broker in iron and metals and will also buy plants for dismantling. William Alderman is treasurer.

The Imperial Shock Absorber Co., Inc., 1039 Harrison Street, San Francisco, Cal., is manufacturing hydraulic shock absorbers for automobiles. Its plant is complete and it is now able to turn out 100 sets per day. Its requirements include short shafts, drilled and threaded steel plates, steel balls, and ball and socket connections. C. E. Boone is president, R. A. Terry, vice-president, J. M. Howell, business manager.

The Western Art Hardware Mfg. Co., 227 Higgins Building, Second and Main Streets, Los Angeles, Cal., has erected a plant and now is in production on builders' hardware. Eventually, it will extend activities to produce wrought iron products. M. E. Waggoner is one of the principals.

The Powell & Evans Log Hoister Mfg. Co., Ferriday, La., has been incorporated with \$50,000 capital stock to manufacture log hoister and other timber machinery. It is planning to build a plant in a few months. John Powell is one of the heads.

The Ruth Puncture Proof Automobile Wheel Co., 1311 South Fourth Street, Wilmington, N. C., incorporated with \$100,000 capital stock, will manufacture automobile wheels, part of the work to be done by contract. Plans are being made to build a plant which will be used for assembling. No contracts have been let thus far. T. L. Ruth heads the company.

The Climax Tractor Starter Co., Climax, Mich., has been organized to manufacture automobile specialties. It has finished work on a plant in which equipment has been installed and operations have begun. A. B. Verney is one of the heads.

The Southern Stove Works, Evansville, Ind., plans to build and equip a new plant for the production of malleable castings for general use. Edward Hiechle is president and S. A. Reese is treasurer.

The Tamahawk Snowplow Co., Tamahawk, Wis., has been organized to manufacture snow plows and equipment. All operations are being done under contract. Fred Bunsiker is president and J. H. Floyd, vice-president.

The Murray Body Corporation, recently incorporated in Michigan, has been formed to acquire all properties of the C. R. Wilson Body Co., Towson Body Co. and J. C. Widman & Co. Main plants are located in Detroit, and an additional plant is located in Bay City.

The National Labeling Machine Co., care of S. E. Meserve, 417-25 West Seventh Street, Los Angeles, Cal., recently organized with capital stock of \$250,000, will manufacture labeling machines, all work being done by contract.

The Painter-Bundy Tool Co., Box 1162, Fort Worth, Tex., has been incorporated with capital stock of \$150,000 to manufacture drilling and fishing tools. Its main plant is at Fort Worth and branch plant at Wichita Falls, Tex. Special attention will be given to a new rotary bit and core drill. M. A. Bundy is president.

STEEL AND INDUSTRIAL STOCKS

The range of prices on active steel and industrial stocks from Monday of last week to Monday of this week was as follows:

	Low	High		Low	High
Allis-Chalmers ..	64 1/2	68 1/2	Int. Har. pf....	115	115
Allis-Chal. pf. .103	103 1/2	103 1/2	Jones & L'lin pf.110 1/2	111 1/2	111 1/2
Am. B. S. & Fdy. 89	90	90	Lima Loco.	65 1/2	67 1/2
Am. Can.	144 1/2	150%	Midvale Steel ..	28	28
Am. Can pf....	116 1/2	117	Nat.-Acme	7 1/2	7 1/2
Am. Car & Fdy. 175 1/2	184 1/2	184 1/2	Nat. En. & Stm. 25 1/2	32 1/2	32 1/2
Am. C. & F. pf. 123 1/2	123 1/2	123 1/2	Nat. En. & S. pf. 78	79 1/2	79 1/2
Am. Locomotive. 85 1/2	89	89	N. Y. Air Brake 47	49 1/2	49 1/2
Am. Loco. pf....	118 1/2	120	Otis Steel 9%	10 1/2	10 1/2
Am. Radiator. 128	135 1/2	135 1/2	Otis Steel pf.... 54 1/2	57 1/2	57 1/2
Am. Radiator pf.125	125	125	Pressed Stl. Car 56 1/2	59	59
Am. Steel Fdries. 41	43 1/2	43 1/2	Pressed Stl. pf.. 81	82	82
Am. Stl. Fd. pf. .108	109	109	Replogle Steel .. 19	22	22
Bald. Loco.	121 1/2	125 1/2	Republic 52%	57 1/2	57 1/2
Bald. Loco. pf....	114 1/2	114 1/2	Republic pf. ... 93	93 1/2	93 1/2
Beth. Steel	47 1/2	49 1/2	Sloss-Sheffield 78 1/2	81	81
Beth. Stl. 7% pf. 94	94	94	Sloss-Sheffield pf. 95	96	96
Beth. Stl. 8% pf. 107 1/2	109	109	Superior Steel .. 31	32	32
Chic. Pneu. Tool 89 1/2	91 1/2	91 1/2	Transue-Wms. .. 30 1/2	32	32
Colo. Fuel	37 1/2	40 1/2	Un. Alloy Steel... 26 1/2	27	27
Crucible Steel ..	69 1/2	73 1/2	U. S. Pipe..... 133 1/2	143 1/2	143 1/2
Crucible Stl. pf. 96 1/2	97	97	U. S. Pipe pf.... 100	101	101
Deere pf.	81	83 1/2	U. S. Steel.... 115%	118 1/2	118 1/2
Gen. Electric ... 270 1/2	280 1/2	280 1/2	U. S. Steel pf.... 121	121 1/2	121 1/2
Gt. No. Ore Cert. 32 1/2	35	35	Vanadium Steel. 27	29 1/2	29 1/2
Gulf States Steel 78	82 1/2	82 1/2	W'house Air Br. 105 1/2	111	111
Inland Steel ... 45 1/2	47 1/2	47 1/2	Y'gstown S. & T. 67 1/2	72	72
Int. Har.	103	109			

Industrial Finance

In its consolidated balance sheet as of Sept. 30, the Otis Elevator Co. shows current assets of \$17,118,457, and current liabilities of \$1,490,909, leaving net working capital of \$15,627,547, about \$2,000,000 more than on March 31. Sales extending over the first 10 months of the year aggregated \$35,612,872.

Net profit of the Hydraulic Steel Co., Cleveland, was \$281,390 during the period of receivership from Oct. 27, 1923, to Oct. 31, last. Thomas P. Goodbody, receiver, showed in his statement that sales during that period totaled \$5,149,500. Net profit after allowing for depreciation and cost of special tools, was \$281,390. This reduced the profit and loss deficit to \$3,547,979.

The American Steel Foundries, has declared the regular quarterly dividends of 75c. a share on common stock and 1% per cent on preferred. After the directors' meeting, President R. P. Lamont said that operations were at about 70 per cent of capacity.

Stockholders of the Penn Seaboard Steel Corporation on Dec. 12 will vote on the proposal to increase capital stock 100 per cent through a new issue of 1,500,000 shares, no par value. Money to be derived from the sale of the new shares will be used to complete the company's Newcastle plant, for the installation of two open-hearth furnaces and for the construction of a strip mill.

The Symington Co., Rochester, N. Y., railroad equipment, has sold 200,000 shares of Class A and 66,666 shares of common stock to bankers, who have sold the shares to investors at \$27.50 per share for the Class A stock to yield 7 1/2 per cent on the investment. Common shares were distributed as a bonus to purchasers of Class A shares. The company has no funded debt. Its share capitalization outstanding consists of 200,000 shares of Class A and 300,000 shares of common stock, there being no par value in both cases.

Stockholders of the Hartford Tube Products Co., Hartford, Conn., have voted to liquidate the company and to go out of business. Factory equipment at the Elmwood plant will be sold and creditors paid in full. It is estimated there will be assets sufficient to pay stockholders a final dividend of about 20 per cent.

Directors of the Blaw-Knox Co., Pittsburgh, subject to ratification by the stockholders of the company at a meeting to be held Dec. 8, have declared a stock dividend of 60 per cent on the common stock and a cash extra dividend of 4 per cent on the same issue, both payable Dec. 24, to stockholders of record at the close of business Dec. 13.

J. J. Thelen has been appointed receiver for the Advance Foundry Co., St. Joseph, Mich. Several months ago the stockholders of the company voted to discontinue the business, it being unprofitable.

In its third-quarter report, the Wickwire-Spencer Steel Corporation shows a deficit of \$249,989, after depreciation, interest and charges, against net profit of \$351,474, after miscellaneous charges, but before depreciation and interest in that period of 1923. Net sales totaled \$3,830,164 and gross income before charges was \$334,625.

The Keystone Steel & Wire Co., Peoria, Ill., showed net earnings for the fiscal year ended June 30, last, of \$629,641

after all deductions, including Federal taxes. This total established a new record for the company and was equivalent, after preferred dividend requirements, to \$15.50 a share earned on common stock outstanding. Net earnings for the previous fiscal year were \$564,728, or \$13.57 a share on common stock.

The Ludlum Steel Co., reports consolidated net income for the quarter ended Sept. 30, of \$15,576 after depreciation, interest and Federal taxes, equivalent to 13c. a share earned on 120,000 shares of no par value outstanding. This compares with \$61,456, or 51c. a share in previous quarter, and \$90,131, or 75c. a share in the first quarter of this year. For first nine months of 1924 net income totaled \$167,163, of \$1.39 a share.

The Republic Iron & Steel Co. has completed arrangements for the sale of \$4,000,000 five per cent short-term notes to bankers, to provide funds to pay for new plant construction. Bankers announce the new construction includes a \$3,500,000 by-product coke plant at the company's Southern subsidiary.

The Coppus Engineering Corporation, Worcester, Mass., is privately offering for sale \$200,000 seven per cent ten-year first mortgage convertible sinking fund bonds, at \$100 and accrued interest. Money derived from the sale of these bonds will be used to retire outstanding mortgages and for additional working capital. F. H. C. Coppus is president of the company, J. Verner Critchley, treasurer.

The American Chain Co. reports net profits for the first nine months of 1924 of \$1,214,457, after depreciation but before taxes and interest. The balance sheet as of Sept. 30 shows current assets of \$12,752,136 and current liabilities of \$1,700,302.

Preferred stock of the Iron Products Corporation to the extent of \$987,300 will be retired at \$110 a share on May 15, according to a recent announcement.

The Atlas Tack Corporation in the quarter ending Sept. 30 operated at a loss of \$26,707, notwithstanding net sales were \$462,458. For the corresponding period last year the firm showed a net loss of \$17,945, on net sales of \$474,373. The showing for the year to Sept. 30 also discloses that the company has not been out of red figures in 1924. Net sales for the nine-month period totaled \$1,617,127, while a net loss of something like \$101,243 is reported. Last year in the first nine months the company had a profit of \$70,021.

The Mystic Iron Works, Boston, has moved its executive-quarters from the sixth to the eighth floor, Room 804, First National Bank Building, 1 Federal Street. T. W. Kennedy is vice-president and general manager.

J. MacIntyre Jaycox, being the sole surviving member of Ernest Law & Co., dealers in iron, steel, coke, coal and railroad equipment, announces that the business will continue as Jaycox & Co., Harrison Building, Philadelphia.

Gary Tube Co. Contracts for Power

The Gary Tube Co., a subsidiary of the United States Steel Corporation, now constructing a steel tube plant at Gary, Ind., has closed a contract for electrical power with the Calumet Gas & Electric Co., Samuel Insull, president, 72 West Adams Street, Chicago. The power will be supplied from a sub-station of the Calumet Gas & Electric Co. at Aetna, Ind. This sub-station, which is nearing completion, is connected with the super-power line of the Calumet Power Co., which, in turn, is connected with the Calumet generating station of the Commonwealth Edison Co., South Chicago, and the generating station of the Public Service Co. of Northern Illinois at Joliet. The super-power transmission line will carry 132,000 volts to the Aetna sub-station, where it will be stepped down to a suitable voltage for distribution to the steel plant and other customers in the district.

Austrian-Czechoslovak Cartel Extends Its Operations

The agreement between the Austrian and Czechoslovak steel industry is reported to have been extended beyond the original division of the respective markets and now embraces the export markets of Italy, Hungary, Jugoslavia, Albania, Greece, Bulgaria, Roumania, Turkey in Europe, and Poland, Assistant Trade Commissioner Elbert Baldwin reports from Vienna. Export sales by both industries are to be joined under a single administration, situated in Vienna for sales to Italy and Jugoslavia and in Prague for sales to all other countries. The object is to reduce sales costs and to bring competition within the following limits: Austrian industry 60 per cent pig iron and 35 per cent semi-finished and finished products; Czechoslovak industry 40 per cent pig iron and 65 per cent semi-finished and finished products.

For Contents of This Issue See Orange Insert

Machinery Markets and News of the Works

FAIR VOLUME OF BUYING

Pennsylvania Railroad and Central New Jersey Issue Small Lists

Demand Seen for Machines That Will Advantageously Replace Obsolete Equipment

PURCHASES were in fair volume in most districts during the week, and inquiry continues good. The remaining weeks of the year probably will be quiet, but an active market is looked for in the early part of the new year.

Regarding the outlook for machine tools, E. F. DuBrul, general manager of the National Machine Tool Builders Association, does not look for an immediate expansion, but says there is a market of a sort ahead for machines that will advantageously replace obsolete equipment.

Demand for punch presses and other metal forming equipment has been good. Export inquiry has been more active.

The Pennsylvania Railroad is inquiring for two grinders and a bushing press for one of its Eastern shops, and an inquiry for six tools has been issued by

the Central Railroad of New Jersey. Action on a small list of the Louisville & Nashville Railroad is expected this week.

Bids on the list of 28 tools for a vocational school at Irvington, N. J., were opened Dec. 10, and it is reported that another list, which will include woodworking and other equipment, will be issued soon. The 70 machines for the Collinwood High School, Cleveland, have been placed.

Turret lathes, shapers, grinding machinery and power presses were purchased by the Nash Motors Co., and the Ajax Motors Co., during the week. It is expected that sensitive drills and other miscellaneous items for the Nash interests will be bought soon.

Other prominent buyers during the week include the Miehle Printing Press Co., Chicago, which took 14 tools, and the Union Pacific, which purchased a large number of woodworking machines and 10 metal-working tools for the new Nampa, Idaho, shops of the Pacific Fruit Express.

Machine tools orders, according to information collected by the National Machine Tool Builders' Association, fell off in volume in November from October. The index figure for November was 20.85 against 23.48 in October. The November showing is better than September for which the index was 18.06.

New York

NEW YORK, Dec. 16.

INQUIRIES, generally for one or two tools each, continue to appear but purchasing is still light. An active demand for presses from stamping and drawing shops, toy makers and manufacturers of electrical goods, is reported. The railroads are still contributing to current activity with small lists. The latest inquiry of this type comes from the Central Railroad of New Jersey and calls for about six tools, including power hand saws, an axle lathe, drill press and a wheel lathe. Neither the Lehigh Valley nor the New York Central inquiry is reported closed as yet. Bids were opened Dec. 10 on the list of 28 small tools for the Essex County Board of Education in New Jersey for installation at a new vocational school at Irvington. Included in the list were five engine lathes, a magnetic chuck, two drills, two drill presses, a shaper, portable electric grinder, bench grinder, metal cutting machine, etc. A further list will be issued later to include wood-working machinery and other equipment.

Recent machine-tool purchases have been largely from industrial users. The Byers Machine Co., Ravenna, Ohio, has closed on a side-head boring mill and the Pennsylvania Car Co. has purchased an axle lathe. Export inquiry has been more active recently and gives promise of developing into actual business.

The Miami Copper Co., 61 Broadway, New York, is completing plans for its proposed ore crushing works at Globe, Ariz. The work will include ore bins, pumping plant and power equipment and is estimated to cost \$900,000.

The Bureau of Yards and Docks, Navy Department, Washington, will soon ask bids for extensions and improvements in the incinerator plant and power house at the Brooklyn Naval Hospital, to include a hand-operated can hoist, duplex steam pump, radial brick stack and other equipment, specification 5032.

The American Consulate, Rio de Janeiro, Brazil, has information regarding a company which has been organized with a capital of \$1,160,000 to construct a cement mill at Rio Grande, State of Rio Grande do Sul, in which the Federal Government is interested and will contribute one-half.

Information at the Bureau of Foreign and Domestic Commerce, Washington, reference 150040.

The Duplex Condenser & Radio Corporation, Sperry Building, Brooklyn, will purchase the plant and business of the Duplex Engine Governor Co., Inc., and contemplates expansion for the manufacture of condensers and other radio apparatus. Additional machinery will be installed in the present plant to double the output of 2500 condensers per day. To provide for the acquisition and expansion, a stock issue of \$343,750 is being sold. Leo Potter is president.

Fire, Dec. 13, destroyed the three-story plant of the United Metal Covered Door & Sash Co., 2052-54 Bronx Street, Bronx, New York, including building and equipment. An official estimate of loss has not been announced. It is planned to re-establish the works.

Ovens, power equipment, conveying and other machinery will be installed in the new plant to be erected at Detroit by the Ward Baking Co., Southern Boulevard and St. Mary's Avenue, New York, estimated to cost \$1,000,000.

Magnuson & Kleinert, 52 Vanderbilt Avenue, New York, architects, have completed plans for a two-story automobile service, garage and repair building, 75 x 130 ft., at 199-203 State Street, Brooklyn, to cost \$70,000.

The Polish Ministry of Industry and Commerce, Warsaw, plans the installation of elevators, traveling cranes, conveying and other machinery in connection with proposed improvements at the port of Gdynia, including warehouses, breakwater, etc., estimated to cost \$9,650,000. The American Consulate, Warsaw, has information regarding the project, also the Bureau of Foreign and Domestic Commerce, Washington, reference 20132.

C. H. Jennings, Inc., 1763 Broadway, New York, automobile distributor, has leased a five-story building, 100 x 100 ft., at 240-46 West Sixtieth Street, heretofore occupied by the Glidden-Buick Corporation, for a new service and repair building.

Motors, power equipment, conveying and other machinery will be installed in the new plant to be erected by the New York Evening Post, 20 Vesey Street, on Carlisle Street, between West and Washington Streets, 133 x 180 ft., to cost \$1,500,000. Plans are being prepared. John C. Martin is vice-president and treasurer.

Walker & Gillette, 128 East Thirty-seventh Street, New York, architects, have completed plans for a two and one-half story automobile service, repair and garage building, 104 x 110 ft., at Mount Kisco, N. Y., estimated to cost \$75,000.

The Stromberg Motor Devices Co., 250 West Fifty-seventh Street, New York, manufacturer of carbureters, etc., has leased the building at 517-19 West Fifty-seventh Street, extending through to 514-16 West Fifty-eighth Street, 50 x 200 ft., for a new plant.

The Flintkote Co., Maple and Paterson Avenues, East Rutherford, N. J., manufacturer of roofing products, has awarded a general contract to the Ferber Construction Co., 16 Johnson Avenue, Hackensack, N. J., for a one and two-story plant at Ridgefield Park to cost \$100,000 with equipment. It will replace the works recently destroyed by fire. Headquarters are at 31 St. James Avenue, Boston.

The Standard Oil Co. of New Jersey, 26 Broadway, New York, has plans for a two-story steam power house at its refinery on the Caven Point Road, Jersey City, N. J., to cost \$203,000 with equipment.

Fire, Dec. 9, destroyed the plant of the Manufacturers' Oxygen Co., West Side and Terhune Avenues, Jersey City, N. J., manufacturer of industrial oxygen, etc., with loss approximating \$150,000 including machinery. Plans for re-building are said to be under consideration.

The Hudson County Buick Co., 870 Bergen Street, Jersey City, N. J., local representative for the Buick automobile, has plans for a two-story service, repair and garage building, 100 x 168 ft., to cost \$120,000. John T. Rowland, 100 Sip Avenue, is architect.

Chicago

CHICAGO, Dec. 15.

THE past week has been marked by heavy buying, although the bulk of the purchases has been made by relatively few companies, notably the Nash Motors Co. and its subsidiary, the Ajax Motors Co., the Miehle Printing Press Co., Chicago, and the Pacific Fruit Express. General buying, in fact, is showing the expected decline as the holidays approach. An active market, however, is looked for with the turn of the year, when numerous machine-tool programs now in course of preparation are to be released. Recent orders placed by the Nash interests include \$60,000 worth of turret lathes, \$100,000 worth of grinding equipment and a considerable number of heavy power presses. A source of considerable business in lighter machine tools during the past month or two has been the radio industry.

The Miehle company has closed for two 60-in. x 72 x 14-ft. planers, a 36-in. x 36 x 10-ft. planer, two engine lathes, six milling machines and three 5-ft. radial drills. The Union Pacific has bought for the new Nampa, Idaho, shops of the Pacific Fruit Express a large number of wood-working machines and the following metal-working equipment: One engine lathe, one 4-spindle nut tapper, two bolt cutters, one Nazel hammer, one bending brake, one squaring shear, one drill press and two punches and shears. The Pennsylvania has issued a list including a number of items assigned to the Fort Wayne, Ind., shops. Business which is likely to be placed promptly includes 50 spindles of sensitive drills and other miscellaneous items for the Nash interests. The Pullman Car & Mfg. Corporation has closed for two 1500-lb. steam hammers.

The Imperial Box Co., 1540 Carroll Avenue, Chicago, has awarded contract for a second-story addition, 72 x 118 ft., to cost \$25,000.

The Altorfer Brothers Co., Peoria, Ill., manufacturer of washing machines, will erect an addition to house a galvanizing department.

A three-story building occupied by the pattern shop and foundry department of the Fisher Machine Works, Leavenworth, Kan., was recently damaged by fire.

The Buzz Co., Lake Street and Colfax Avenue South, Minneapolis, manufacturer and jobber in art novelties, has started the construction of a three-story addition to cost \$285,000.

The Missouri Power & Light Co. will erect an electric power plant to cost \$200,000 at Boonville, Mo.

Fire recently damaged the plant of the Gardiner Metal Co., Forty-eighth Place and Rockwell Street, Chicago.

David S. Klafter, 64 West Randolph Street, Chicago, architect, has plans for a five-story and basement automobile service, repair and garage building at 925 Kinsie Street, estimated to cost \$250,000 with equipment.

The Illinois Power & Light Corporation, Champaign, Ill., is disposing of a bond issue of \$5,000,000, a portion of the

proceeds to be used for extensions and improvements in plants and system. Clement Studebaker, Jr., is president.

The Fargo Marble & Granite Works, Inc., Fargo, N. D., is planning the erection of a two-story stone-working and foundry building, 100 x 100 ft., estimated to cost \$50,000. J. E. Rosatti, 117 Broadway, is architect.

The Domestic and Foreign Commerce Department, Chicago Association of Commerce, 10 South La Salle Street, has received an inquiry (4213) from a concern at Havre, France, in the market for foundry supplies, railroad equipment, etc.

The Common Council, Moorhead, Minn., is considering plans for extensions and improvements in the municipal electric light plant and waterworks, with the installation of additional equipment. R. G. Price is city clerk.

The Department of Public Works, A. A. Sprague, commissioner, Room 406, City Hall, Chicago, has preliminary plans for a new pumping plant for the water department to cost approximately \$2,500,000 with machinery. W. D. Murdoch, City Hall, is city engineer.

Manual training equipment will be installed in the new two-story high school to be erected at Winona, Minn., estimated to cost \$200,000, for which bids will be asked on a general contract early in January. Croft & Boerner, Inc., 1006 Marquette Avenue, Minneapolis, Minn., are architects.

The Superior Dredging Co., foot of Forty-fifth Avenue West, Duluth, Minn., will soon take bids for a two-story and basement mechanical shop, 75 x 150 ft., on Forty-eighth Avenue West. P. M. Olsen, Bellwood Building, is architect.

St. Louis

ST. LOUIS, Dec. 15.

CONTRACT has been awarded by the More-Jones Brass & Metal Co., 3144 North Broadway, St. Louis, to the Fruin-Coinon Construction Co., Merchants Laclede Building, for a one and two-story foundry and finishing plant, 475 x 680 ft., on Manchester Avenue, to cost about \$450,000. Klipstein & Rathmann, Chemical Building, are architects. John B. Strauch is president.

The Union Electric Light & Power Co., St. Louis, is disposing of a bond issue of \$5,000,000, a portion of the proceeds to be used for extensions and improvements in plants and system. Louis H. Egan is president.

The Sapulpa Refining Co., Sapulpa, Okla., operated by the Mutual Oil Co., has authorized extensions and improvements in its refinery to cost about \$30,000, including equipment.

The Twin City Brick & Tile Co., 516 North Thirteenth Street, Van Buren, Ark., J. W. Hansell, president, recently organized with a capital of \$50,000, contemplates the erection of a new plant on site of 300 acres, reported to cost \$45,000. E. I. Young will be plant superintendent.

The Cape Sand Co., Cape Girardeau, Mo., has plans for a new sand and gravel plant, with hoisting, conveying, loading and other machinery, estimated to cost \$25,000. Linder Diemund is president.

The American Ice Co., Harrison and Forty-eighth Streets, Kansas City, Mo., will begin the construction of a one-story ice-manufacturing and cold storage plant at Wyandotte and Spring Streets, 75 x 80 ft., and 55 x 80 ft., with one-story engine house, 80 x 90 ft. It is reported to cost \$125,000, with machinery. Hans Von Unwerth, Finance Building, is architect and engineer.

The Wichita Millwork Co., 900 East Gilbert Street, Wichita, Kan., will begin the erection of a new two-story wood-working plant, 108 x 116 ft., to cost \$27,000.

The Jonesboro Cotton Mills, Inc., Jonesboro, Ark., plans the construction of a steam-operated electric power plant in connection with a proposed textile mill to cost \$250,000. R. C. Biberstein, Charlotte, N. C., is architect and engineer.

The Wabash Railroad Co., Railway Exchange Building, St. Louis, is said to be planning the construction of additional locomotive repair shops at North Kansas City, Mo., in connection with new yards at this point. R. H. Howard is chief engineer.

A. C. Fabry, 213 Commercial Building, Tulsa, Okla., architect, has plans for a three-story and basement automobile service, repair and garage building, 100 x 135 ft., to cost \$90,000, with equipment.

A general contract has been awarded by W. D. Beard and associates, Pawhuska, Okla., for a one-story ice manufacturing plant, 75 x 100 ft., to cost \$75,000. Refrigerating machinery, transmission and conveying equipment will be required.

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The Crane Market

INQUIRY continues light for both electric overhead and locomotive cranes, but there is a fair volume of pending business, the accumulation of several weeks. Among the larger awards now pending are those of the General Electric Co., the New York Edison Co. and the Phoenix Utility Co. Electric companies have been particularly active lately. In addition to these prospective purchasers, Roger M. Freeman, engineer, 8 West Fortieth Street, is understood to have closed this week on a 25-ton overhead crane and a 25-ton stationery hoist for the Indiana Hydroelectric Co. for installation at its new Oakdale plant. Another award, expected in a few days, is that of the Baltimore & Ohio Railroad, about to purchase a 20-ton, 50-ft. span, 4-motor overhead crane for Staten Island. Minotte Brothers, Pittsburgh, are understood to have closed on a locomotive crane with a builder in the Northwest. The Public Service Production Co., Newark, is receiving bids on a 15-ton, 17-ft. 9-in. span hand power crane for the City Dock substation.

The Illinois Steel Co. is in the market for a 75-ton and 20-ton electric crane for Gary, Ind. The Wisconsin Steel Co., Chicago, is inquiring for a 150-ton stripper crane and a 5-ton charging crane for a new blooming mill. The Bureau of Reclamation, United States Reclamation Service, opens bids Dec. 22 on a 40-ton overhead crane.

Among recent purchases are:

Farrel Foundry & Machine Co., Ansonia, Conn., a 10-ton, 51-ft. 6-in. span overhead traveling crane from the Milwaukee Electric Crane & Mfg. Co.

Consolidated Mining & Smelting Co. of Canada, Ltd., Montreal, a 20-ton, 28-ft. span electric traveling crane from an American builder.

American Car & Foundry Co., a 10-ton electric traveling crane from a builder in the Northwest.

Ford, Bacon & Davis, New York, a 60-ton overhead crane for the Arkansas Light & Power Co., from the Whiting Corporation.

Freyn, Brassert & Co., Chicago, a 20-ton locomotive crane for the Mystic Iron Works, Everett, Mass., from the Industrial Works.

Carter Oil Co., Parkersburg, W. Va., nine 2-ton, hand power, wall bracket jib cranes, from the Chisholm & Moore Mfg. Co.

Cuyahoga Steel & Wire Co., Bedford, Ohio, a 1½-ton, single I beam crane with one motor from the Chisholm & Moore Mfg. Co.

Lehigh-Portland Cement Co., Allentown, Pa., a 15-ton and 25-ton electric crane from the Chisholm & Moore Mfg. Co.

Guggenheim Brothers, 120 Broadway, New York, a 20-ton locomotive crane for export to Chile, from the Browning Co.

W. F. Hall Printing Co., Chicago, two 5-ton, 54-ft. span overhead traveling cranes and two 5-ton, 57-ft. span overhead cranes from a builder in the Northwest.

Beaver Products Co., Grand Rapids, Mich., plant, one 4-motor, 46-ft. 8-in. span bucket crane to handle 1-cu. yd. bucket, from the Milwaukee Electric Crane & Mfg. Co.

New England

BOSTON, Dec. 16.

ALTHOUGH local machine-tool dealers are securing only an occasional order, sentiment is more optimistic, being based on the increased number of inquiries. These, as a rule, are for one, two or three machines but intimate purchases will not be made until after Jan. 1. The aggregate number of inquiries, however, is the largest noted in many months. The sale of a used 48-in. measuring machine to a ship builder, and a new vertical surface grinder to a central Massachusetts tool manufacturer were among the most important during the week. Small tool business in November was less than for October. Sales so far this month have fallen below those for the corresponding time in November.

New England machine-tool builders, in general, are more optimistic. A manufacturer of boring machines reports the sale of a large machine to a New Jersey elevator maker and a sizable inquiry from a New Orleans concern, together with numerous other inquiries. A Rhode Island maker of grinding machinery is running through a large stock order on the strength of early 1925 prospective customers. Another Rhode Island machine-tool builder placed a substantial order for machine parts castings with a Worcester Mass., foundry. A New Hampshire lathe maker is busier than for months, both on stock orders and actual tools sold. Encouraging reports come from many other sections of New England. Some machine-tool builders already are apprehensive over the supply of skilled labor in 1925.

The Narragansett Electric Light Co., 800 Turks Head Building Providence, R. I., has awarded contract for a one-story 40 x 80 x 60 ft. coal pulverizing plant. Jenks & Ballou, 10 Weybosset Street, Providence, are the architects.

The Board of Water Commissioners, Bristol, Conn., has taken an option on property on Riverside Avenue, near Warner Court, as a site for a proposed tool shop, meter shop and other buildings for the water department.

The Lynn Gas & Electric Co., Lynn, Mass., is planning for extensions in its steam-operated electric power plant at West Lynn, including improvements in the present station, estimated to cost \$2,000,000 with equipment.

The American Bosch Magneto Co., Springfield, Mass., will devote a portion of its works to the manufacture of radio equipment, including a "nobattery" device for supplying current to radio sets without batteries.

Superstructure work is under way for the proposed one-story plant for the Wood Hydraulic Hoist & Body Co., 3371 Washington Street, Jamaica Plain, Boston. The Warren Engineering Co., Terminal Wharf, Charlestown, Mass., is engineer.

B. F. Perkins & Son, Inc., Holyoke, Mass., manufacturer

of paper and pulp mill machinery, has awarded a general contract for its four-story plant, 76 x 154 ft. Lockwood, Greene & Co., 24 Federal Street, Boston, are architects and engineers.

Ralph H. Doane, 162 Newbury Street, Boston, architect, has plans for a seven-story automobile service, repair and garage building on Bowdoin Street, estimated to cost \$350,000, for which bids will be asked early in January.

The Merrimac Oil Burning Co., 53 Merrimac Street, Boston, plans the purchase of an engine lathe, drill press and other equipment.

Cincinnati

CINCINNATI, Dec. 15.

IMPROVEMENT in the machine-tool situation continues and some fair-sized orders have been received by manufacturers in this district. Purchasing of machine tools by the Nash Motors Co. continues and the past week an order for eight shapers was placed in this territory. The United States Shipping Board closed for four large engine lathes and the Navy Department for two. The Louisville & Nashville Railroad is expected to close on a small list this week. The Pennsylvania Railroad is buying for several of its shops, including Fort Wayne, but orders are mostly for single machines. Demand for punches, shears and metal-forming machinery has been good and metal furniture manufacturers, sash manufacturers and car builders have placed orders for this class of equipment the past two weeks. Inquiries continue in good volume and prospects are bright for increased business after the first of the year.

Loss of \$20,000 was caused by fire at the plant of the Chipman Plating & Foundry Co., Cincinnati. It will be rebuilt as soon as possible.

The Citizens Auto Parts Co., Dayton, Ohio, is preparing to erect a two-story plant for manufacturing automobile accessories. J. J. Jacobs, 12 Hamilton Avenue, is president.

The Continental Mfg. Co., Springfield, Ohio, has been incorporated with a capitalization of \$100,000 to manufacture automobile accessories. A. R. Hill and Hubert D. White, Springfield, are interested in the company which is preparing plans for a factory, definite announcement of which will be made later.

The Columbus Railway, Power & Light Co., 104 North Third Street, Columbus, Ohio, has plans for a three-story automobile service, repair and garage building, estimated to cost \$200,000 with equipment, for company trucks and cars.

The Nivison-Weiskopf Co., 218 Elm Street, Cincinnati, manufacturer of paper products, has awarded a general

contract to John Singer, Reading, Ohio, for a one-story addition to its Reading plant, 100 x 100 ft., to cost about \$30,000. Carl J. Kiefer, Schmidt Building, Cincinnati, is architect. E. L. Mills is president.

L. J. Bryant, 1666 Broadway, Paducah, Ky., is desirous of locating an iron-working plant in position to contract for the manufacture of agricultural implements and parts.

The Wakefield Brass Co., Vermilion, Ohio, manufacturer of lighting fixtures, etc., has authorized the immediate rebuilding of the portion of its main plant destroyed by fire Dec. 4, with loss of \$50,000, including machinery. Albert Wakefield is in charge.

Manual training equipment will be installed in the two-story high school to be erected at New Lexington, Ohio, estimated to cost \$250,000, for which bids will soon be asked. John Adams, Southern Hotel, Columbus, Ohio, is architect.

George W. Bolinger, Mooresburg, Tenn., is in the market for a lathe, drill press and other equipment for automobile parts and repair work.

The Tennessee Bauxite Brick Co., Chattanooga, Tenn., recently organized, is considering the erection of a new plant for an initial output of about 10,000 brick per day. J. J. Farnsworth, Chattanooga, is president.

The American Cement Paint Co., Rossville, Tenn., will proceed with the erection of the first unit of a new plant at Chattanooga, Tenn., to be one-story, 50 x 175 ft., estimated to cost \$65,000. Other units will be built later. The plant at South Rossville will be moved to the new location, and additional machinery installed. W. P. D. Moros is president.

Indiana

INDIANAPOLIS, Dec. 15.

PLANS are being prepared by the Central Welding & Brazing Co., 219 East Market Street, New Albany, Ind., for a new one-story plant, 50 x 64 ft. Earl Embrey, Elsby Building, is architect.

The Plaza Oil Co., 606 Odd Fellows Building, Indianapolis, has plans for a four-story automobile service, repair and oil distributing building, estimated to cost \$250,000 with equipment. Vonnegut, Bohn & Miller, Indiana Trust Building, are architects. N. E. Carter is president.

The Hoosier Steel & Wire Co., 2230 Almont Street, Indianapolis, will install additional equipment for considerable increase in capacity.

The Wabash Railroad Co., Railway Exchange Building, St. Louis, is said to be planning the construction of new locomotive and car repair shops at Peru, Ind. Additional classification yards will be built at this location. R. H. Howard is engineer.

The Standard Oil Co., of Indiana, Indianapolis, is said to be planning for the construction of an addition to its refinery at East Chicago, Ind., work to begin early next spring.

The Board of Education, Portland, Ind., plans the installation of manual training equipment in its proposed two-story and basement high school estimated to cost \$140,000, for which it is expected to ask bids soon on a general contract. Nicol, Scholer & Hoffman, 308 Main Street, Lafayette, Ind., are architects.

The Allmum Mfg. Co., Marion, Ind., manufacturer of curling irons, hot plates, electric toasters and heaters, now at Western and Euclid Avenues, will move to the plant formerly occupied by the Marion Baking Co. at Eleventh and Adams Streets, where enlarged facilities will be provided.

Buffalo

BUFFALO, Dec. 15.

PLANS are being prepared by the Upson Co., Lockport, N. Y., manufacturer of wallboard products, for a two-story addition, 60 x 100 ft., for which bids will be asked on a general contract in about 90 days. Schmill & Son, Prudential Building, Buffalo, are architects.

Beals, McCarthy & Rogers, Inc., 50 Terrace Street, Buffalo, iron and steel, has awarded contract to the John W. Cowper Co., Fidelity Building, for a four-story storage and distributing plant, 45 x 158 ft., on Mackinaw Street, near Katherine Street, to cost about \$100,000 with equipment. R. J. Reidpath, Mutual Life Building, is architect.

The Utica Gas & Electric Co., Utica, N. Y., will purchase the municipal electric light and power plant at Clinton, N. Y. Extensions will be made and additional equipment installed to provide 24-hr. service.

Motors, power equipment, conveying and other machinery will be installed in the three-story plant to be erected by the Hornell Evening Tribune. Hornell, N. Y., to cost \$90,000. Harry Haskell, Heulett Building, Elmira, N. Y., is architect.

The Common Council, Lackawanna, N. Y., is considering the installation of pumping equipment in its proposed sewage disposal plant, for which plans will be drawn by the F. K. King Co., Prudential Building, Buffalo, architect. It is estimated to cost \$150,000 with machinery.

The Barnum Brothers Co., 179 River Street, Syracuse, manufacturer of leather transmission belting, etc., is said to be planning to rebuild the portion of its machine shop and works recently damaged by fire. An official estimate of loss has not been announced.

The Board of Education, City Hall, Syracuse, has plans for remodeling a building on Fenton Street for an annex to the Delaware vocational school. Tools and equipment will be installed. E. A. Howard, Everson Building, is architect.

The Ellison Brass Mfg. Co., Falconer, N. Y., is in the market for equipment for a new bronze foundry under construction.

The American Lithographic Co., Buffalo, has preliminary plans for an addition, for which considerable electrically operated equipment will be required. Frank J. Hackford is general manager.

Manual training and vocational equipment will be installed by the Board of Education, St. Johnsville, N. Y., in connection with the erection of a new junior high school to cost \$175,000, for which a bond issue has been approved. It is expected to ask for bids on a general contract about Feb. 1.

Philadelphia

PHILADELPHIA, Dec. 15.

THE Southern Coal & Iron Co., 1414 South Penn Square, Philadelphia, is contemplating extensions in its iron concentrating plant at Rittenhouse Gap, Pa., including additional machinery.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until Dec. 23 for 5000 ft. of steel tubing for the Philadelphia Navy Yard, schedule 3040; also for 150 casters and 200 caster truck wheels for the same yard, schedule 3026.

The Philadelphia Electric Co., Tenth and Chestnut Streets, Philadelphia, has plans for a one-story power house on Delaware Avenue to cost about \$40,000. Application has been made for permission to construct a hydroelectric generating plant on the Susquehanna River. A subsidiary company will be formed to carry out the project.

The Electric Service Supplies Co., Seventeenth and Cambria Streets, Philadelphia, manufacturer of electrical equipment, has acquired 5½ acres at Westmoreland and Fox Streets and is said to be contemplating the early erection of a new plant on a portion of the site.

The Foreign Trade Bureau, Philadelphia Commercial Museum, has received an inquiry (42994) from Kantawala Nanavati & Co., Fort, Bombay, India, desiring to get in touch with American manufacturers of machinery and parts and now in the market for a large quantity of ½ x 1½-in. machine bolts, round heads, and ½ x 1¼-in. round heads; an inquiry (42986) from Carr, Haynes y Compania, Augustinas 1041, Santiago, Chile, desiring to get in contact with American manufacturers of railroad and tramway supplies, hydraulic supplies, gas and electrical supplies, mining equipment, bakers' and confectioners' tools, safety electric lamps for miners, stamping presses, tobacco machinery, power transmission machinery, gas works supplies, brewers' and bottlers' machinery and other equipment.

John and James Dobson, Inc., 809 Chestnut Street, Philadelphia, has plans for extensions in its steam power house at Ridge and Crawford Streets, estimated to cost \$40,000 including equipment.

The General Smelting Co., Stock Exchange Building, Philadelphia, will proceed with the erection of a one-story plant on Westmoreland Street, estimated to cost \$20,000, for which a general contract has been let to Henry E. Baton, Inc., 1713 Samson Street.

The Air Reduction Co., 342 Madison Avenue, New York, is reported to be contemplating the construction of a new plant at or near Lebanon, Pa.

The Hazard Mfg. Co., Wilkes-Barre, Pa., manufacturer of wire rope, cables, etc., has plans for a four-story works, 125 x 1000 ft., for which bids will be asked on a general contract early in the coming year. Several smaller buildings will also be erected. Fletcher-Thompson, Inc., Bridgeport, Conn., is engineer.

The Oil-Water Burner Corporation, Scranton, Pa., recently formed with a capital of \$120,000, is contemplating the establishment of a plant at Honesdale, Pa., for the manufacture of oil burners and other heating equipment. A. W. Patterson, Scranton, is general manager.

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The Reading Knob Works, Inc., Gregg Avenue, Reading, Pa., manufacturer of hardware products, has plans for a three-story addition, 30 x 200 ft., for which bids will soon be asked on a general contract. Claude B. Mengel, 1122 Penn Boulevard, Wyomissing, Pa., is architect. Charles L. Heizmann is president.

The American Car & Foundry Co., Milton, Pa., is planning for enlargements in its pressed steel department for the manufacture of tanks and other steel plate work, estimated to cost \$25,000. Headquarters are at 165 Broadway, New York.

The Consolidated Gas, Electric Light & Power Co., Lexington Building, Baltimore, will erect a new coal-handling plant at Holtwood, Pa., to cost \$85,000 with machinery.

The Bath Portland Cement Co., Bath, Pa., will proceed with the construction of its proposed cement mill at Sands Eddy, near Easton, Pa., estimated to cost \$1,500,000, for which plans have been drawn by the Public Service Production Co., Public Service Terminal Building, Newark, N. J., engineer and contractor. The last noted company will also be in charge of erection.

Milwaukee

MILWAUKEE, Dec. 15.

PLACEMENT of some of the requirements of the Ajax Motors Co., Racine, a Nash affiliation, has benefitted the Milwaukee machine-tool production market noticeably. Otherwise, the automotive industries are buying rather sparingly, and only for necessary replacements. Foundries and machine shops in general have made some headway in booking orders, but the most pleasing feature is the work that lies in the foreground. Inquiry is developing in a most satisfactory manner, indicating, perhaps business early in the new year.

The Crucible Steel Casting Co., 612 Clinton Street, Milwaukee, which is devoted principally to electric furnace processes, has announced plans for the complete replacement of its plant, on double the present scale, on a new site, early in 1925. It will be situated on 14½ acres along the Chicago & North Western tracks, opposite the works of the South Side Malleable Casting Co., owned by the same interests. Plans are being prepared for the new group, the main building of which will be 150 x 350 ft., including the foundry and pattern shop. There also will be an office building, 40 x 60 ft., pattern vault and miscellaneous service buildings. Contracts will be let about Feb. 1 and the plant ready May 1. Albert C. Lange is president and general manager.

The Liberty Foundry Co., town of Wauwatosa, Milwaukee County, has let the general contract to the William F. Tubbing Co., 373 Broadway, Milwaukee, for a brick and steel addition, 35 x 66 ft. The work, including additional equipment, will cost about \$25,000.

M. Tullgren & Sons, architects and engineers, 425 East Water Street, Milwaukee, have been engaged by a syndicate of local capital, the identity of which is withheld for the present, to prepare plans for a new cold storage warehouse and refrigerating plant, eight stories, 80 x 75 x 200 ft., estimated to cost \$1,250,000. Besides a complete steam generating unit, refrigerating plant and other equipment, eight to ten electric elevators, conveyor system and other machinery will be required. Plans will be ready for contractors' bids about Jan. 1.

The Milwaukee Board of Industrial Education, Sixth and Prairie Streets, Milwaukee, is asking bids until Dec. 23 for the construction of the substructure of Unit 3 of the Central Continuation School, to cost about \$2,000,000. Bids on the super-structure will not be asked until Feb. 1 or March 1. Two units costing about \$1,500,000 each already have been completed and are in service. The school eventually will cover the square block bounded by State, Prairie, Sixth and Seventh Streets. R. L. Cooley is director, and Archie O. Muehl is secretary of the board.

The Valley Paper Mills, Inc., Neenah, Wis., a new organization, has leased the former plant of the defunct Elm Paper Box Co., same city, and after making alterations will install complete equipment, with individual electric motor drive, for manufacturing milk bottle caps, shipping tags and other paper specialties. The work will be completed about Feb. 1.

The Beloit, Wis., Board of Vocational Education has selected plans by Merman & Skogstad, architects, La Crosse, Wis., for the proposed new vocational training center, 153 x 175 ft., two stories and basement, estimated to cost \$200,000. Plans will be ready about Feb. 1. Purchase of departmental equipment will be deferred until plans are completed. A. B. McCreary is principal.

The Cudahy, Wis., Board of Education has selected

Robert A. Messmer & Brother, architects, 221 Grand Avenue, Milwaukee, to design a new high and vocational training school, for which purpose \$300,000 is available. Details will be ready about Jan. 15 and bids will be asked immediately thereafter. F. H. Schade, 722 Layton Avenue, is president of the board.

The Pressed Steel Tank Co., Milwaukee, manufacturer of steel barrels, drums and other containers, acetylene cylinders, annealing pots, pressure tanks, etc., has issued \$500,000 first (closed) mortgage serial gold bonds, the proceeds to be used to facilitate the enlargement of production and business generally. The plant is situated in West Allis and consists of six acres with buildings of 200,000 sq. ft. of floor space. Fixed assets were appraised March 15, 1924, at \$1,257,535. Herman O. Brumder is president.

Pittsburgh

PITTSBURGH, Dec. 15.

MACHINE-TOOL business has been good recently in this district, although the tendency of the trade generally is still to regard the prospective market better than the present. The Pennsylvania Car Co., Sharon, has closed for a Betts car wheel borer, a Pond axle lathe and a 400-ton Chambersburg wheel press. Sale of a punch and shear is noted to a Pittsburgh automobile equipment manufacturer, the same agent reporting orders for a bending machine and five medium-sized hydraulic presses the past week.

The McClintic-Marshall Co. has bought a few punches and shears for installation in its recently acquired Chicago district plants. Inquiry still is brisk and the expectation is general that 1925 will be a good business year.

In power equipment the outstanding award of the week was a 20,000 kva. waterwheel and generator unit by the Aluminum Co. of America to the Allis-Chalmers Mfg. Co. for installation at Cheoah, N. C.

The Dreyer Metal Products Co., 5607 Butler Street, Pittsburgh, will build a one-story addition to cost about \$13,000.

The Peter Bottler Co., Eighth Street and Tenth Avenue, Beaver Falls, Pa., Peter Bottler, head, contemplates the construction of a new brick manufacturing plant near Homewood Junction, Pa., estimated to cost \$300,000 with machinery. It will include a steam power house and machine shop.

The Dean Coal Mining Co., Elk Garden, W. Va., plans to rebuild the portion of its forge and blacksmith shop and fan house recently destroyed by fire with loss estimated at \$30,000 including equipment.

The Cherry River Boom & Lumber Co., Scranton, Pa., has authorized rebuilding the portion of its planing mill and lumber plant at Richwood, W. Va., recently destroyed by fire with loss estimated at \$250,000 including equipment.

The Lewisburg & Ronceverte Electric Railway Co., Lewisburg, W. Va., has inquiries out for a gasoline freight motor with capacity for handling about 75 tons in standard cars. R. M. Bell is general manager.

Detroit

DETROIT, Dec. 15.

WORK will begin on rebuilding of the portion of the plant of the Champion Brass Works, Inc., Coldwater, Mich., recently destroyed by fire. An official estimate of loss has not been announced.

The Austin Machinery Corporation, Muskegon, Mich., manufacturer of concrete mixers, gasoline locomotives, etc., is said to be considering plans for an addition early in the spring. Headquarters are at Toledo, Ohio.

I. M. Smith & Son, Marcellus, Mich., manufacturers of commercial bodies for automobiles, will erect a one and two-story plant, 60 x 173 ft., to replace their works recently destroyed by fire.

The Grand Rapids Railway, Grand Rapids, Mich., has awarded a general contract to F. W. Burgstahler & Son, Houseman Building, for rebuilding its one and two-story car barns and shops recently destroyed by fire with loss of \$100,000. Williamson, Crow & Proctor, Gilbert Building, are architects. L. J. DeLamarter is vice-president and general manager.

The Ford Motor Co., Detroit, is having plans drawn for a new one-story building at its River Rouge plant, 145 x 400 ft., for which bids will soon be asked on a general contract.

for superstructure. Albert Kahn, Marquette Building, is architect.

The Kermath Mfg. Co., 5890 Commonwealth Avenue, Detroit, manufacturer of marine engines and parts, has awarded contract to Marlow, Barry & Co., McKerchey Building, for a one-story addition, 45 x 55 ft., to cost \$25,000. B. Farr is president.

The Calumet & Hecla Co., Calumet, Mich., has arranged an expansion program at its copper smelting plant to include the enlargement of furnace equipment and the installation of electric power apparatus and automatic dipping, charging and slag haulage equipment.

M. B. Giberson, Ann Arbor, Mich., has leased the foundry of the Lewis Spring & Axle Co., Chelsea, Mich., and will establish a new plant for the production of iron and other metal castings. Mr. Giberson for some time acted as receiver for the Production Foundries Co., Ann Arbor.

The Detroit Edison Co., 2000 Second Street, Detroit, plans the construction of a new automatic power substation on Beaubien Street.

The Lansing Pure Ice Co., 911 Center Street, Lansing, Mich., will rebuild the portion of its ice-manufacturing plant recently destroyed by fire with loss of \$35,000 including equipment. W. Rueter is general manager.

The New Egyptian Portland Cement Co., Port Huron, Mich., is reported to be planning the purchase of conveying machinery, elevating and other equipment in connection with mill expansion.

Cleveland

CLEVELAND, Dec. 15.

THE 70 machines recently inquired for by the Cleveland Board of Education for the Collinwood high school were placed during the week, one dealer taking over half of the tools and the remainder being divided among several other machinery houses. A local manufacturer closed on 25 turret lathes for the Nash Motors Co., Kenosha, Wis. Sales of single machines were in good volume, and although December is usually a slow month, indications are that bookings will show a gain over November.

Inquiries continue to improve and more good business is in prospect than for months, although it is not expected that many orders covering several machines will be placed before January. One dealer has scattering inquiries for 15 to 20 machines from companies planning extensions. Orders include a 36-in. side head boring machine placed by the Byers Machine Co., Ravenna, Ohio. The Pennsylvania Railroad has an inquiry out for an internal grinder, crank-shaft grinder and a 100-ton buffing press for one of its Eastern shops.

The Ajax Mfg. Co., Cleveland, manufacturer of bolt heading, upsetting and other machinery, has placed a contract with the H. K. Ferguson Co. for its new plant at Chardon Road and Nickel Plate Railroad. The main building will be a machine and erecting shop, 129 x 384 ft. A total floor space of 73,500 sq. ft. will be provided. A two-story office building will also be erected. The erecting shop will be equipped with one 30-ton, one 10-ton and four 5-ton cranes. The company is now inquiring for cranes and will probably purchase a few machine tools, as some of its present equipment will be scrapped. It has sold its present plant to the Great Lakes Sash & Door Co.

The Diamond Metal Weatherstrip Co., Spruce Street, Columbus, Ohio, has placed contract for a one-story factory, 60 x 120 ft. William Tremaine, 602 Chamber of Commerce, is the architect.

The Bunting Brass & Bronze Co., Toledo, Ohio, will shortly take bids for a three-story addition. Mills-Rhines-Bellman & Nordhoff, Ohio Building, are the architects.

The Humphrey Mfg. Co., Mansfield, Ohio, has revised plans for a one-story factory, 94 x 117 ft. Vernon Redding & Association, Bird Building, are the architects.

The Clay City Pipe Co., Uhrichsville, Ohio, will shortly begin the erection of a three-story plant, 120 x 240 ft., to cost \$200,000. Sixteen kilns will be built. E. E. Milliyer, Uhrichsville, is the engineer.

Manual training equipment will be provided in the senior high school to be built in Mansfield, Ohio, bids for which will be taken Jan. 5. John H. Brister is clerk of the Board of Education.

The City of Painesville, Ohio, will take bids about Jan. 1 for a \$125,000 filtration plant. Seven motor-driven centrifugal pumps will be required.

The Board of Commissioners, Lake County, Painesville, Ohio, is having plans prepared for a sewage disposal plant at Mentor Headlands. Pumps and miscellaneous equipment will be required.

A manual training department will be provided in a school to be built at Reynoldsburg, Franklin County, Ohio, for which bids will be taken about Jan. 15. W. E. Weeks is president of the Board of Education.

The Gulf States

BIRMINGHAM, Dec. 15.

THE Texas Public Utilities Co., Dallas, Tex., operated by the Southwestern Power & Light Co., 71 Broadway, New York, is completing plans for a steam-operated electric power house on the Trinidad River, near Trinidad, Tex., with initial capacity of 40,000 kw. Later the output will be increased to 150,000 kw. It is expected to cost close to \$1,500,000. The company also has a tract of 3000 acres of lignite lands in this section to be developed and worked for fuel supply.

The Thompson Ice Co., Key West, Fla., contemplates enlargements in its ice-manufacturing plant to increase the capacity from 50 to 100 tons per day, estimated to cost \$80,000. Norberg Thompson is president.

The Clarksville Cotton Oil Co., Clarksville, Tex., is considering rebuilding the portion of its plant destroyed by fire Dec. 2 with loss estimated at \$35,000 including equipment.

The Louisiana Power Co., Sterlington, La., is disposing of a bond issue of \$2,250,000, a portion of the proceeds to be used in connection with its proposed local steam-operated electric generating plant. The company is affiliated with the Arkansas Light & Power Co., Pine Bluff, Ark. H. C. Couch is president of both organizations.

The H. B. Tennison Mfg. Co., 2019 Congress Street, Houston, Tex., is completing plans for a new three-story factory at Franklin Avenue and Hamilton Street, 100 x 245 ft., for the manufacture of corrugated metal shingles, roofing, etc., estimated to cost \$90,000 with equipment.

The United States Naval Air Station, Pensacola, Fla., Lt. Richard H. Gilford, public works officer, is planning for the installation of pumping machinery in connection with a proposed waterworks system.

The Dallas Power & Light Co., Dallas, Tex., has secured permission to erect a new unit at its steam-operated electric generating plant to cost \$2,582,000. The company recently completed a large extension and will proceed with the addition later.

The Valley Refining Co., San Benito, Tex., is planning the construction of a new oil refinery to develop an initial output of 500 bbl. per day. A department will be installed for the production of lubricating oils and grease. The plant will cost \$100,000 with machinery. C. B. Hedrick and T. J. Holmesley, both of Dallas, Tex., head the company.

The Florida-McCracken Concrete Pipe Co., P. O. Box 872, Tampa, Fla., contemplates enlargements in its plant to double the present capacity. W. J. McCracken is president.

The City Commission, Coleman, Tex., is completing plans for extensions in the municipal electric light and power house, including the installation of additional machinery, to cost \$25,000.

The Oliver & Myers Mfg. Co., Canton and Young Streets, Dallas, Tex., has awarded a general contract to the American Construction Co., 17 West Washington Street, for a five-story plant, 100 x 200 ft., to manufacture furniture, estimated to cost \$200,000 with machinery. H. E. Spalti is president.

L. C. Rivas, Jacksonville, Fla., manufacturer of cement products, has acquired two acres at Roselle and Acosta Streets, fronting on the line of the Atlantic Coast Railroad, and contemplates the erection of a new plant to cost \$45,000.

Kifuri Brothers, Eagle Pass, Tex., plan the construction of a steam-operated electric power house in connection with the proposed development of about 1300 acres adjoining Eagle Pass for a new industrial city.

The Common Council, New Smyrna, Fla., is considering the installation of electric-operated pumping equipment in connection with proposed waterworks extensions and betterments to cost \$70,000. A special election to vote bonds will be held in January.

The Polk City Utilities Co., Polk City, Fla., recently formed with a capital of \$100,000, has preliminary plans for the construction of an electric light and power house. Isaac Van Horn is president.

A lathe, drill press, forge and other machine shop equipment will be purchased by the Frost Lumber Co., Montrose, La., to replace equipment recently destroyed by fire.

Pacific Coast

SAN FRANCISCO, Dec. 10.

CONTRACT has been let by the Atchison, Topeka & Santa Fe Railroad Co., Los Angeles, to Robert E. McKee, San Bernardino, Cal., for the erection of a new boiler shop, plate works and machine shop at San Bernardino, estimated to cost \$525,000 with equipment.

The Elk Mfg. Co., 5012 South Main Street, Los Angeles, manufacturer of automobile bodies, is having plans drawn for a one-story factory, 75 x 100 ft., in the Central Manufacturing District. William P. Neil, Terminal Building, Central Manufacturing District, will superintend construction.

Ovens, power equipment, conveying and other machinery will be installed in the two-story plant to be erected by the Perfection Bread Co., Sacramento, Cal., to cost about \$115,000. Plans are being drawn by Leonard F. Starks, Ochsner Building, architect.

The Bloedel-Donovan Lumber Co., Bellingham, Wash., is considering rebuilding its box manufacturing plant and wood-working shops, with power house, recently destroyed by fire. The new structures are estimated to cost \$400,000 with machinery. A hammer head conveying system will be installed. J. H. Bloedel is president.

The City Council, Boise, Idaho, is said to be considering the erection of a municipal electric power plant at Lake Clear to cost \$100,000 with machinery. C. C. Stevenson is city engineer.

The J. G. McDonald Chocolate Co., Salt Lake City, Utah, is seriously considering the building of a power plant for the manufacture of its own electrical power and wishes to get in touch with houses selling used machinery and equipment.

The Pacific Meter Works, Inc., 2136 Atlantic Street, Los Angeles, is considering the construction of a two-story plant on Atlantic Street to cost \$50,000 with equipment. M. K. Miller is general manager.

The City Council, Tombstone, Ariz., has preliminary plans for the installation of a municipal electric light and power plant.

The Los Angeles Pressed Brick Co., Frost Building, Los Angeles, has engaged Morgan, Walls & Clements, Van Nuys Building, architects, to prepare plans for rebuilding the portion of its works destroyed by fire Nov. 30 with loss of \$350,000. The new structure will be three stories and basement, 200 x 200 ft., with foundations for two additional floors later, estimated to cost \$400,000 with equipment.

The Board of Trustees, Newport Beach, Cal., will soon ask bids for the installation of an electric operated pumping plant in connection with a proposed waterworks at Corona Del Mar, estimated to cost \$300,000. Two twin Diesel engine driven pumping units will be installed each with capacity of 800 gal. per min. Paul E. Kressly, H. W. Hellman Building, is engineer.

South Atlantic States

BALTIMORE, Dec. 15.

THE Republic Boiler & Radiator Co., Munsey Building, Baltimore, is considering the erection of a one-story addition on Union Avenue, for which it is expected to have plans drawn early in the spring.

The Georgia Light, Power & Railways, Inc., Macon, Ga., is disposing of a note issue of \$2,500,000, a portion of the proceeds to be used for extensions and improvements. John D. Everitt is president.

W. O. Whitley, Mauk, Ga., is in the market for a 6 to 10-hp. engine, boiler and accessory apparatus.

The Lafayette Cotton Mills, Inc., Lafayette, Ga., has authorized plans for the complete electrification of its works to replace all steam-driven equipment. Lockwood, Greene & Co., Healey Building, Atlanta, Ga., are architects and engineers.

The Bureau of Supplies and Accounts, Navy Department, Washington, will take bids until Dec. 23 for 9000 sq. ft. wire cloth for the Hampton Roads, Va., Navy Yard, schedule 3046; for a quantity of condenser tubes for the Puget Sound Navy Yard, schedule 3038; for 25,000 lb. sheet lead for the Mare Island Navy Yard, schedule 3017; and 9600 lb. sheet lead for the Norfolk, Va., yard, schedule 3045.

The Blue Ridge Talc Co., Inc., Henry, Va., plans the purchase of a hammer type pulverizer, suitable for iron ore to $\frac{1}{2}$ -in. size, capacity about $2\frac{1}{2}$ tons of ore per hr.

The Wateree Power Co., Camden, S. C., has plans for the construction of a new electric generating station to cost \$500,000 with machinery. The company has arranged for an increase in capital from \$7,500,000 to \$11,000,000, a portion of the fund to be used for expansion. J. B. Duke heads the company.

The Erwin Feldspar Corporation, 3405 Clifton Avenue, Baltimore, will make enlargements in its grinding plant at Erwin, Tenn., to develop a capacity of approximately 3000 tons monthly. The company recently took over the local plant and properties of the Crabtree Feldspar Corporation. R. W. Lawson is president.

The Georgia Railway & Electric Co., Atlanta, Ga., is disposing of a bond issue of \$3,151,000, a portion of the proceeds to be used for extensions and improvements in plants and systems. Thomas K. Glenn is president.

The Atlanta Bottling & Ice Co., 273 Courtland Street, Atlanta, Ga., is planning for the installation of additional boilers and other power equipment in connection with extensions to its plant. Lockwood, Greene & Co., Healey Building, are architects and engineers.

The general purchasing officer, Panama Canal, Washington, will receive bids until Jan. 8 for Diesel engine-driven electric generator equipment for standby generator stations, circular 1644.

The Board of Education, Salisbury, N. C., plans the installation of manual training equipment in a proposed high school to cost \$125,000, for which plans have been prepared by C. Gadsden Sayre, Greensboro, N. C., architect.

The Twin City Products Co., Bluefield, W. Va., has plans for the construction of a new factory for the manufacture of roofing cement and kindred specialties.

The Blue Ridge Power Co., Hendersonville, N. C., will proceed with the installation of machinery at its proposed hydroelectric generating plant on the Green River, about 35 miles from Spartanburg, S. C. The present installation will consist of two turbo-generators, each with rating of 3650 hp., and accessory machinery. Later another unit of the same size will be installed. The entire project, with power dam and transmission lines, will cost approximately \$900,000.

The Anderson Cotton Oil Co., Anderson, S. C., plans to rebuild the portion of its grinding department recently destroyed by fire with loss estimated at \$10,000.

The Jencks Lumber Co., New Market, S. C., has acquired timber property in Colleton County, S. C., and plans the installation of a saw mill and lumber equipment. A steam power house is said to be under consideration.

The United States Coast Guard, Fourteenth and E Streets, N. E., Washington, will take bids until Dec. 29 for marine oil engines in lots of 10, 14, and 20.

The supply officer, Navy Yard, Washington, will take bids immediately for one standard two-wheel floor grinder, ordnance requisition 182.

Canada

TORONTO, Dec. 15.

WHILE a good volume of business is pending, machine-tool sales the past week have been somewhat below the average. The approaching holiday season is the chief reason for the falling off in business, but an active buying movement is looked for after the first of the year. In many cases builders are well supplied with orders, which in addition to prospective demands, will insure continued operations for several months. Some interest is reported in new and second-hand tools for replacement purposes.

The Burlington Canning Co., Burlington, Ont., is in the market for a $7\frac{1}{2}$ -hp. electric motor, 60-cycle, two-phase, 200 volt, 600 r.p.m.

Lambert's Planing Mill, Welland, Ont., was destroyed by fire Dec. 9 with a loss of \$200,000. Considerable valuable machinery was burned.

The Imperial Oil Co., Toronto, contemplates purchasing a site of 10 acres on the Ashbridges Bay Industrial Area, Toronto, for the erection of an oil plant to cost \$500,000.

The Picton Electrics, Ltd., Picton, Ont., is having plans prepared for the erection of an iron foundry in connection with its plant.

P. W. Gardiner & Son, Galt, Ont., have awarded the general contract to G. H. Thomas & Sons for an addition to their machine shop. Some equipment will be purchased.

The Beach Foundry, Ottawa, Ont., manufacturer of stoves, ranges, etc., is erecting a new building in connection with its plant, which is expected to be completed and machinery installed within five months. The addition will be one story, 60 x 80 ft.

The Hoyt Metal Co., Eastern Avenue, Toronto, has started work on an addition to cost \$350,000, which is expected to be in operation by next April. The building will be 175 x 250 ft., of steel glass and brick construction.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of items the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE, under the general heading of "Iron and Steel Markets" and "Non-Ferrous Metals."

Bars, Shapes and Plates		Per Lb.
Refined iron bars, base price.....	3.24c.	
Swedish charcoal iron bars, base.....	7.00c. to 7.25c.	
Soft steel bars, base price.....	3.24c.	
Hoops, base price.....	4.49c.	
Bands, base price.....	3.99c.	
Beams and channels, angles and tees, 3 in. x 1/4 in. and larger, base.....	3.34c.	
Channels, angles and tees under 3 in. x 1/4 in., base.....	3.24c.	
Steel plates, 1/4 in. and heavier.....	3.34c.	

Merchant Steel		Per Lb.
Tire, 1 1/2 x 1/2 in. and larger.....	3.20c.	
(Smooth finish, 1 to 2 1/2 x 1/4 in. and larger).....	3.55c.	
Toe-calk, 1/2 x 3/8 in. and larger.....	4.20c.	
Cold-rolled strip, soft and quarter hard.....	7.00c.	
Open-hearth spring steel.....	4.50c. to 7.00c.	
Shafting and Screw Stock:		
Rounds.....	4.15c.	
Square, flats and hex.....	4.65c.	
Standard tool steel, base price.....	15.00c.	
Extra tool steel.....	18.00c.	
Special tool steel.....	23.00c.	
High-speed steel, 18 per cent tungsten.....	70c.	

Sheets		Per Lb.
Blue Annealed		
No. 10	3.89c.	
No. 12	3.94c.	
No. 14	3.99c.	
No. 16	4.09c.	

Box Annealed—Black		Per Lb.
Soft Steel		
C. R. One Pass		
Per Lb.		
Nos. 8 to 20.....	4.30c. to 4.45c.	
Nos. 22 and 24.....	4.45c. to 4.60c.	5.10c.
No. 26	4.50c. to 4.65c.	5.15c.
No. 28*	4.60c. to 4.75c.	5.25c.
No. 30	4.70c. to 4.95c.	

Galvanized		Per Lb.
No. 14	4.70c. to 4.85c.	
No. 16	4.85c. to 5.00c.	
Nos. 18 and 20.....	5.00c. to 5.15c.	
Nos. 22 and 24.....	5.15c. to 5.30c.	
No. 26	5.30c. to 5.45c.	
No. 28*	5.60c. to 5.75c.	
No. 30	6.10c. to 6.25c.	

Welded Pipe		Per Lb.	
Standard Steel			
Black Galv.			
1/2 in. Butt...—41	—24	1/2 in. Butt..—4	+19
3/4 in. Butt..—46	—32	3/4 in. Butt..—11	+9
1-3 in. Butt..—48	—34	1-1/2 in. Butt..—14	+6
2 1/2-6 in. Lap..—44	—30	2 in. Lap....—5	+14
7-8 in. Lap..—41	—11	2 1/2-6 in. Lap. —9	+9
9-12 in. Lap. —34	—6	7-12 in. Lap. —3	+16

Bolts and Screws		Per Lb.
Machine bolts, cut thread, 50 and 10 per cent off list		
Carriage bolts, cut thread, 35 to 35 and 10 per cent off list		
Coach screws, 45 and 10 per cent off list		
Wood screws, flat head iron, 75, 20, 10 and 5 per cent off list		

Steel Wire		Per Lb.
BASE PRICE* ON NO. 9 GAGE AND COARSER		
Bright, basic	4.25c. to 4.50c.	
Annealed soft	4.50c. to 4.75c.	
Galvanized annealed	5.15c. to 5.40c.	
Coppered basic	5.15c. to 5.40c.	
Tinned soft Bessemer	6.15c. to 6.40c.	

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire		BASE PRICE
High brass sheet		18 1/2c. to 19 1/2c.
High brass wire		18 1/2c. to 19 1/2c.
Brass rods		16 1/2c. to 17 1/2c.
Brass tube, brazed		26 1/2c. to 27 1/2c.
Brass tube, seamless		22 1/2c. to 23 1/2c.
Copper tube, seamless		24 c. to 24 1/2c.

Copper Sheets		Per Lb.
Sheet copper, hot rolled, 21 1/2c. to 22 1/2c. per lb. base.		
Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.		

Tin Plates		Per Lb.
Bright Tin		
Grade "AAA"	Grade "A"	
Charcoal	Charcoal	
14x20	14x20	
IC.. \$11.25	\$8.85	
IX.. 12.85	10.85	
IXX.. 14.40	12.55	
IXXX.. 15.75	13.85	
IXXXX 17.00	15.05	
Coke—14 x 20		
80 lb.. \$6.15	Prime	Seconds
90 lb.. 6.30		6.05
100 lb.. 6.45	6.20	
IC.. 6.65	6.40	
IX.. 7.85	7.60	
IXX.. 9.00	8.75	
IXXX.. 10.35	10.10	
IXXXX.. 11.35	11.10	

Terne Plates		Per Lb.
100 lb.		\$7.00 to \$8.00
IC		7.25 to 8.25
IX		8.25 to 8.75
Fire door stock		9.00 to 10.00

Tin		Per Lb.
Straits, pig		58c.
Bar		62c. to 65c.

Copper		Per Lb.
Lake ingot		16 1/2c.
Electrolytic		16 c.
Casting		15 c.

Spelter and Sheet Zinc		Per Lb.
Western Spelter		8c.
Sheet zinc, No. 9 base, casks		12c. open 12 1/2c.

Lead and Solder*		Per Lb.
American pig lead		10 1/2c. to 11c.
Bar lead		13c. to 15c.
Solder, 1/2 and 1/2 guaranteed		41c.
No. 1 solder		38c.
Refined solder		32c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal		Per Lb.
Best grade, per lb.		75c. to 90c.
Commercial grade, per lb.		35c. to 50c.
Grade D, per lb.		25c. to 35c.

Antimony		Per Lb.
Asiatic		17c. to 18c.

Aluminum		Per Lb.
No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.		36c.

Old Metals		Per Lb.
Copper, heavy crucible		12.25
Copper, heavy wire		11.50
Copper, light bottoms		9.75
Brass, heavy		7.25
Brass, light		6.00
Heavy machine composition		9.25
No. 1 yellow brass turnings		8.00
No. 1 red brass or composition turnings		8.25
Lead, heavy		8.00
Lead, tea		6.25
Zinc		4.00
Cast aluminum		16.00
Sheet aluminum		16.00

For Contents of This Issue See Orange Insert